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ABSTRACT

A project was conducted to identify outcomes and procedures for measuring the occupational competency of students completing a coherent sequence of courses in career and technology education (C&TE) programs throughout Texas. Phase 1 of the project focused on horticulture/floriculture/landscaping and child care occupations. The major activities of phase 1 were as follows: comprehensive review of literature about workplace competencies in the two study occupations that have been developed by other states; telephone survey of offices of education in other states to identify competencies currently being used in C&TE and to determine how the competencies were established and validated; identification of occupational competencies based on a review of the literature review, telephone survey results, existing occupational competencies lists, and the competencies identified in the Secretary's Commission on Achieving Necessary Skills report; and validation of the identified exit-level competencies through a Delphi survey of industry representatives in horticulture and child care. Lists of exit-level competencies were developed and validated for students in secondary- and postsecondary-level agricultural technology and child care programs. (Contains 19 tables and 58 references. Appendixes constituting approximately 60% of this document contain the following: list of advisory committee members, project-related correspondence, and project questionnaires and interview forms.) (MN)

ED 388 856

Authentic Assessment for Occupational Competency for Career and Technology Education

FINAL REPORT
(Year One)

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in cooperation with
Texas Education Agency

June, 1994

Project Number: 444-20170

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Final Report

Project Number: 444-20170

Authentic Assessment for Occupational Competency for Career and Technology Education

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June, 1994

The project reported herein was performed through a contract with the Texas Education Agency under the provisions of the Carl D. Perkins Vocational Education Act (Public Law 101-392). Contractees undertaking such projects are encouraged to express freely their professional judgement in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Texas Education Agency position or policy.

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Dallas, Texas

College Flowers
Lubbock, Texas

C. C. Verde Florist
Austin, Texas

Margie's Flowers, Gifts, Nursery & Garden Center
Lamesa, Texas

McShan's Florist
Dallas, Texas

Poe Floral
Eastland, Texas

Child Care
Secondary
Abilene Montessori Center
Abilene, Texas

All Saints Health Care, Inc.
Fort Worth, Texas

Casa de Amigos
Midland, Texas

Clayton Child Care, Inc.
Fort Worth, Texas

Gingerbread House Preschool Daycare
San Angelo, Texas

Happy Days Christian School
Jacksonville, Texas

Kiddie Castle
Bryan, Texas

KinderCare Learning Center
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Levelland, Texas

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Austin, Texas

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Coppell, Texas

Gill Landscape Nursery
Corpus Christi, Texas

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Irving, Texas

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Houston, Texas

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Houston, Texas

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Muleshoe, Texas

YWCA of El Paso
El Paso, Texas

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Internal Revenue Service
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Houston, Texas

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Shaver's Private School
Lubbock, Texas

Spring Branch ISD Child Care
Houston, Texas

St. Mary's Episcopal Day School
Bellville, Texas

Texas Assoc. of School Boards
Austin, Texas

Texas Migrant Council
Muleshoe, Texas

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CHAPTER I

INTRODUCTION

The Authentic Assessment for Occupational Competency for Career and Technology Education Project was conducted cooperatively by faculty and staff in Agricultural Education and Communication and Home Economics Education at Texas Tech University and the Career and Technology staff of the Texas Education Agency, which served as the funding agency. The project consisted of two separate but interrelated components. One component was designed to identify exit level competencies in the areas of Horticulture and Child Care, using the Delphi technique. The second component consisted of meeting with business and industry representatives to determine methods of authentic assessment most useful for new employee credentials, including skills identified by the Secretary's Commission on Achieving Necessary Skills (SCANS). The purpose of the study was to identify outcomes and procedures for measuring the occupational competency of students who have completed a coherent sequence of courses in Career and Technology Education. The outcomes of the project include validated exit level occupational competencies for two occupations in Career and Technology Education and suggested procedures for the authentic assessment of those competencies. The objectives of the project were to:

1) Identify an occupation in each of two program areas (Home Economics Education - Child Care - and Agricultural Science and Technology - Horticulture) and its exit level competency (determined and validated by business, industry, labor, and education representatives).

2) Identify procedures for authentically assessing validated exit level competencies that include student abilities to demonstrate application of SCANS within the occupation (to include but not be limited to criterion-referenced tests and career portfolios).

The project was conducted from July 1, 1993 through June 30, 1994. Project staff members consisted of faculty and staff in Agricultural Education and Communication and Home Economics Education at Texas Tech University who worked closely with the Career and Technology staff at the Texas Education Agency. Project staff members are listed in the acknowledgements on page iv.

In accordance with the Master Plan for Technical Education, this project addressed excellence and equity (which includes access) for all students and the integration of academic

and career and technology education, promotion of higher order thinking skills, elimination of sex bias and stereotyping, and all aspects of an industry including new technologies. Appropriate information is provided on implementing successful practices for students in at-risk situations and all special populations as identified in the Carl D. Perkins Vocational and Applied Technology Education Act of 1991 (including but not limited to students with disabilities, students who are academically disadvantaged, students who are economically disadvantaged, students with limited English proficiency).

The Authentic Assessment Advisory Committee provided input regarding identification and design of authentic assessment procedures. Advisory committee members, as listed on page iii, included teachers, administrators, Texas Education Agency specialists, and business and industry representatives. The committee included women, men and members of various cultural groups.

One advisory committee meeting was held in April, 1994; the agenda and correspondence related to this meeting are presented in Appendix A. Results of the competency studies were presented to the advisory committee members at the meeting. Committee members were asked to provide input concerning types of authentic assessment deemed useful for evaluating student performance on exit level competencies.

Rationale

Whereas Career and Technology Education (C&TE) in Texas is directly responsible for the preparation of tomorrow's work force, it is imperative that C&TE prepare a work force that can meet the demands of the work place. The mission statement which is found in the *Master Plan for Career and Technical Education* (February, 1993) communicates this need.

> Texas demands a highly skilled and educated work force to compete successfully in the 21st Century global economy. Therefore, Texas will develop a world-class career and technical education that focuses on the skills required by business, industry, and labor and the needs of Texas students and adults for expanded occupational and educational opportunities. This will ensure that Texans participate effectively in the workplace and live successfully with their families and our society. Everyone involved in work must address the critical issues of economic development, educational excellence, access, and equity (p. 10).

The Secretary's Commission on Achieving Necessary Skills (SCANS) (1991) from the United States Department of Labor identified competencies and foundation skills common to all

occupations. The identified competencies and foundation skills were designated as potential indicators of successful entry to the work place. In addition to the workplace basics, there are occupation specific competencies and skills which impact successful entry into the work force.

To ensure that Texans entering the work force can meet the demands of the work place, it is important to assess occupational competencies for all students who complete a coherent sequence of courses in C&TE. The current project developed a framework by which competencies from occupations associated with each program area could be identified and assessed. This framework required the identification of an occupation, the validation of competencies necessary to enter the occupation including SCANS, and the identification of procedures to adequately assess those competencies.

Background

"Authentic assessment" is one of the new names for a process dating back to the time of Socrates's oral examination of students. Today, other names for authentic assessment include alternative assessment, direct assessment, and performance assessment (Herman, Aschbacher, & Winters, 1992; Sweet, 1992; Worthen, 1993; Worthen, Borg, & White, 1993). Just as the names vary, so do the definitions. General definitions include:

> -a form of testing that requires students to perform a task rather than select an answer from a ready-made list (Sweet, 1992, p. 1),
> -a nonverbal test which requires responses in terms of actual tasks or behaviors, rather than a test which requires verbal responses (Kojima, 1990, p. 475),
> -virtually any form of evaluation other than traditional paper and pencil, machine-scored, or multiple-choice tests...[which] provides more valid information on student performance in relation to important knowledge and skills (Stefonek, 1991, p. 2), and
> -**alternatives** to traditional multiple-choice, standardized achievement tests and **direct** examination of student **performance** on significant tasks that are relevant to life outside school (Worthen, 1993, p. 445).

Examples of authentic or performance assessment include performances in music and athletics; proficiency testing in languages; competency testing for pilots and dentists; hands-on assessment in welding, auto mechanics, and carpentry; and portfolios in art (Worthen, 1993). Authentic assessment currently is used in classrooms, but it is more often in the form of formative rather than summative evaluation. The trend is toward overcoming the challenges of authentic assessment to use in high-stakes situations, such as graduation or grade placement.

The idea of assessment is undergoing change. Moses (1992) proposed designing tasks that are worth assessing since the ease of assessment often overrides the importance of what is assessed. New assessment should emphasize learning and thinking processes. Authentic assessment would serve a clearly defined purpose known to both teachers and students, instead of objectives known only to teachers, while being recognized as valid and reliable (Stefonek, 1991). Students would take on active roles in the process of assessment through self-evaluation, and teachers would become reflective practitioners (Moses, 1992; Perrone, 1991). Students should perform, create, produce, or do something which taps higher levels of thinking and problem-solving skills based on instructional activities that invoke real-world application (Herman, Aschbacher, & Winters, 1992). Moses (1992) suggested that the highest score on a performance assessment should be set beyond the current skill level of even the best students in order to represent true standards of excellence.

The present interest in authentic assessment is a result of the turbulence that has rocked education during the past two decades. During the 1970s schools seemed unable to deliver pertinent instruction to students. State legislators responded by passing educational accountability laws that required minimum competency testing. The tests soon narrowed the focus of education, often to the neglect of higher-order thinking and problem solving skills. Further complications were added when graduation was attached to the successful completion of the minimum competency and achievement tests. The limitations of the tests became apparent when the tests were used for increasingly higher stakes for which they were never intended (Shepard, 1989; Worthen, 1993).

Much remains unknown about the effective use of authentic assessment. Until recently, it was considered the answer to all the evils of testing. Upon closer examination, certain drawbacks have been revealed. Reliability and validity must be established with diverse groups on various tasks. Currently, it is not reliable enough to be used in high-stakes situations. It is a very time intensive activity. Time required in the evaluation process of authentic assessment exceeds that spent on grading standardized tests; therefore, the cost in terms of labor escalates (Worthen, 1993).

Although several challenges are evident when using authentic assessment, this method represents numerous appealing factors. These factors include tailoring the assessment to the expected learning, assessing continuously, developing higher levels of thinking, and coaching students. At the present time authentic assessment is useful to assess the outcomes of learning that do not conveniently fit the information tested on standardized evaluation instruments (Worthen, 1993). The push for widespread use (at district, state and national levels) of authentic assessment raises questions concerning reliability, validity, and equity, as well as increased cost during a time of few education dollars. Selective sampling could address a

portion of the challenge. Other ways to answer the challenges must be found. Authentic assessment will become universally useful:

> when it has progressed to the point where outcomes, curriculum, instruction, and student evaluation are integrated into a total system which meets both the educational needs of our society and provides the information required to maintain fuller confidence and political support (Stefonek, 1991, p. 3).

Eight states--California, Delaware, Hawaii, Maine, Massachusetts, Michigan, New York, and North Carolina--have met the challenge of authentic assessment in various subject areas including math, physical education, geography, reading, science, social studies, music, art, second language, listening, and speaking. Alaska, Arizona, Connecticut, New Jersey, and Vermont are piloting authentic assessment. Kentucky is mandated to have a major assessment program completed by 1995 (Aschbacher, 1990).

Three types of authentic assessment are being used extensively: projects, performances, and portfolios (Hoachlander, 1993). **Projects** require the student to research a topic of interest, produce a related product, and make a public presentation demonstrating the product. All parts of the project are judged by a panel of experts selected from community specialists. Another type of authentic assessment is **performance** based on competency tasks. After having sufficient time to practice the task, the student is tested and evaluated on actual performance. The task must be carefully selected to represent important competencies.

The third, and most versatile authentic assessment technique, is the **portfolio**. Portfolios are the most widely used authentic assessment technique. They can present completed work or can contain work from many subjects in varying stages of completion (Paulson, Paulson, & Meyer, 1991). Students may be allowed to select the items to include in the portfolio. Portfolios permit students to highlight their best work in a flexible format. In addition, anchored in authenticity, portfolios have integrity and validity that no other types of assessment offer (Valencia, 1990). Forseth (1992) stresses that portfolios encourage a variety of instructional opportunities, reveal that problem solving becomes part of the curriculum, and model curiosity, flexibility and reflection. The Pittsburgh school district has initiated the Portfolio Exit Assessment in writing (LeMahieu, Eresh, & Wallace, 1992). Vermont's two portfolios are in writing and math (Abruscato, 1993). California is developing portfolios for use in Career & Technology courses (Hanson, 1992). Wisconsin has Employability Skills Portfolios for students beginning in the tenth grade (Stefonek, 1991). Australia uses portfolios in assessing experiential learning (Thomson, 1988).

Other types of authentic assessment also are useful in the classrooms. Filling out forms, marking score sheets, completing observation checklists, making tape recordings, solving math problems, writing short answers, completing graphs, making illustrations or diagrams, writing out the steps in a geometry proof, writing essays, discussing orally, participating in exhibitions, and performing experiments are other types of authentic assessment when appropriately used by teachers. The writing portion of the Texas Assessment of Academic Skills (TAAS) is an example of authentic assessment. When used correctly, authentic assessment can address the true accomplishments of the student.

Questions Addressed in the Project

Major questions examined in the Authentic Assessment project were:

1) What workplace and occupation specific competencies should a student possess upon exiting a coherent sequence of study in Horticulture and Child Care?
2) What SCANS employability skills should be emphasized in relation to the validated competencies?
3) What types of authentic assessment do representatives in business and industry perceive as valuable for entry-level employees?

Definition of Terms

For the purpose of this project, the following operational definitions were used:

Authentic Assessment A form of evaluation that requires students to demonstrate proficiency in a variety of ways rather than select an answer from a ready-made list. For example, a student may be asked to perform a skill, solve a problem, or generate scientific hypotheses. The quality of the student's work is judged based on an established set of criteria. Other terms used for Authentic Assessment included in the literature may be Alternative, Direct, or Performance Assessment.

Competencies Competencies include general employability skills and occupation specific tasks. Competencies are identifiable skills or abilities that are necessary for successful performance in an occupation. Typically, competencies are identified by persons who are directly involved in the occupation in question. These persons may be from management, labor, and/or education. Other terms which are synonymous with competencies include duties and tasks.

Objectives Once competencies are identified for a particular occupation, educators design instructional objectives to guide efforts to plan, implement, and evaluate educational

programs. Instructional objectives are measurable and are derived to aid the student in the acquisition of the competencies.

Coherent Sequence of Courses Courses in Career and Technology Education in the State of Texas are logically ordered so that each course builds upon knowledge, skills, and competencies which were gained in the previous course. For students to receive maximum benefit from a program in Career and Technology Education, it is recommended that the coherent sequence be followed.

Exit Level Competencies For the purposes of this study, exit level competencies refer to the knowledge, skills, and abilities the student has obtained at the time of completion of a coherent sequence of courses at the secondary level. A student in Career and Technology Education may exit the program at many levels. These levels may occur upon graduation from high school or after one or two years of postsecondary education.

Basic Assumptions

The following assumptions were made:

1) The definition of authentic assessment is inclusive of all authentic assessment techniques.
2) Questionnaires were answered by a representative sample of the target populations.
3) Business and industry participants used reflective thinking and answered the questionnaire seriously.
4) Students in C &TE will develop exit-level competencies by completing a coherent sequence of courses.
5) The process of authentic assessment will be implemented statewide.
6) Employability skills as defined by SCANS are important to all areas of C&TE.
7) Current curriculum will be adapted for authentic assessment.
8) C&TE teachers will receive in-service training on the use of authentic assessment.
9) Business and industry will accept authentic assessment credentials/certifications.

Limitations of the Project

The following limitations of the project were recognized:

1) Competency survey included states with published and circulated materials. Others could have been omitted because of data bases selected.
2) Small selected samples might not represent the targeted populations.
3) Innovations emerging in general authentic assessment techniques offer few examples in C&TE areas.
4) Authentic assessment techniques will be successful in both C&TE areas and in general education.

Chapter II of this report describes the methods and procedures used in the research component of the Authentic Assessment Project. Chapter III reports the analysis and interpretation of the survey results, provides discussion and conclusions, and presents implications. In Chapter IV, the procedures, content, and format for a proposed authentic assessment framework are described.

CHAPTER II
RESEARCH METHODS AND PROCEDURES

The purpose of the project was to identify outcomes and procedures for measuring the occupational competency of students who have completed a coherent sequence of courses in C&TE. The objectives of the project were accomplished by activities separated into two distinct phases that were **highly integrated** efforts.

Phase One: Identification of Occupations and Their Exit Level Competencies

Phase one of the project focused on an occupation in each of two program areas (Agriculture Science and Technology and Home Economics Education) and its exit level competencies (Objective 1). A number of resources were drawn upon to accomplish this objective including What Work Requires of Schools: A SCANS Report for America 2000 (Secretary's Commission on Achieving Necessary Skills [SCANS], U.S. Department of Labor, 1991) and the Master Plan for Career and Technical Education (April, 1993). Specific occupations were Horticulture in Agriculture Science and Technology and Child Care in Home Economics Education. Horticulture and Child Care were selected by the State Directors because they are targeted growth areas in Texas and because each area has an easily identified coherent sequence of courses. These occupations served as the foundation for the project.

The activities for Phase One included:

1) A comprehensive review of literature related to work place competencies developed by other states in the areas of Horticulture and Child Care. Information was gathered from many sources which included previously conducted university studies, journal articles, trade publications, graduate student research, professional organizations, and business, labor and industry reports.

2) A telephone survey of offices of education in other states to identify competencies currently being utilized in Career and Technology Education and determining how the competencies were established and validated. This information allowed the project staff to learn what had been effective in other states that might be adapted for use in Texas.

3) Identification of occupational competencies. Building on the comprehensive literature review, telephone survey, existing occupation specific competency lists, and the competencies identified in the SCANS report, a list of competencies needed by students exiting Horticulture and Child Care programs was developed. The Child Care survey combined the previously validated 2+2 Tech Prep Early Childhood Professions I & II and SCANS. The Horticulture survey was designed to produce industry validated competency lists for various horticultural occupations and to validate SCANS for specific horticultural occupations.

4) A Delphi survey of industry representatives in Horticulture and Child Care to validate exit level competencies, including SCANS.

Phase Two: Identification of Procedures for Assessing Validated Competencies

Phase Two focused on the identification of procedures for assessing exit level competencies that include student abilities to demonstrate application of SCANS within the occupation (Objective 2). The following activities were completed:

1) A comprehensive review of literature related to authentic assessment. The literature review provided a basis for identification of assessment procedures being used in both general education and Career and Technology Education in other states.

2) A telephone survey of state offices of education and curriculum centers to identify assessment procedures being used in C&TE across the nation.

3) Input from an advisory committee, consisting of representatives from business and industry, education, administration, Texas Education Agency specialists, and labor. The Advisory Committee reviewed ways to implement authentic assessment including new and/or innovative measures. The Committee assisted in the identification of authentic assessment procedures to be included in a proposed model for statewide use in C&TE .

Development of SCANS Competencies

The Secretary's Commission on Achieving Necessary Skills (SCANS) examined the demands of the workplace and the capability of young people to meet those demands. In determining the level of skills required for entry-level employment, the Commission defined the skills, proposed acceptable proficiency levels, suggested effective assessment methods, and developed a dissemination strategy for school, businesses, and homes. Business owners, public employers, unions members, and workers and supervisors in shops, plants, and stores participated in discussions and meetings. Six special panels were established to examine all manner of jobs from manufacturing to government employment. Commissioned researchers conducted interviews with workers in a wide range of jobs. The SCANS report of effective job performance includes the elements of five competencies, resources, interpersonal skills, information, systems, and technology, and a three-part foundation of basic skills, thinking skills and personal qualities (What Work Requires of Schools, 1991).

Description of Delphi Methodology

The RAND Corporation developed the Delphi technique in the early 1950s utilizing expert opinion related to defense research. In this technique, a group of experts (normally 12 to 15 participants) reaches consensus regarding some stated topic or study. Three reasons for

using Delphi include collective focus on subjective problems, group size that exceeds effective face-to-face interaction, and time/cost limitations (Linstone & Turoff, 1975; Rasp, 1973). The identification of competencies in an occupation area can be subjective in nature. The selected group size of 12 to 15 members exceeds the optimum number of 8 for effective group interaction. The limited time frame for the project and budget constraints eliminated the feasibility of three or more interview sessions needed to accomplish the goals.

Haustein and Maier (1986) describe the Delphi method used by Dalke and Helmer. Delphi involves consulting informed persons about forecasting specific events. The responses are assembled and returned to the participants, who can reconsider responses that differ from those of other panel members. The process repeats until consensus develops. The key features are anonymity and feedback among participants.

The use of Delphi for forecasting has evolved into the areas of education, home economics, and telecommunications (Beach, 1981; Cyphert & Gant, 1971; Lee, 1973; Pelton, 1981; Weaver, 1971). Education uses of the technique in a variety of content areas, in curriculum or competency development, including selecting educational goals and objectives, developing curriculum and determining campus planning program outcomes, assessing effectiveness and measuring cost-benefits (Nash, 1978). The Delphi technique has been used in the development of vocational programs for handicapped students and in evaluation of vocational education programs (Bureau of Occupations & Adult Education, 1990; Elias & Dyrenforth, 1979; Glosson, 1979).

Social science (Allen, 1978), distributive education at the high school level (Lucas & Miles, 1978), curriculum services available to students (Padro, 1978; Hentges & Hosokawa, 1980), marriage and family therapy curriculum (Winkel, Piercy & Hovestadt, 1981), gifted curriculum (Stahl & Stahl, 1991), and technology and information literacy (Doyle, 1992; Volk, 1993) are some of the diverse areas which have used a panel of experts to reach consensus on curriculum goals or objectives.

Another use of the Delphi technique is to determine the foundation of knowledge and skills that students must have to function in the workplace. Science teaching competencies (Simpson & Brown, 1977; Chiappetta, Shores, & Collette, 1978) led the way as one of the earliest areas to be investigated in this particular format. Auto mechanics (Davidson, 1979), speech and drama (Swinton & Bassett, 1981) and food service (Thompson, 1993; Shrock, 1985) are other areas using this technique for competency validation.

Procedures for Validating Competencies

Agriculture - Horticulture

Eleven states were identified through a literature review as having a validated competency list in the area of horticulture. Some of these competency lists were available on microfiche. All of the states were contacted by telephone and were surveyed about the development and validation of their competency lists. Competency lists from these other states were divided into the four areas of horticulture focused on in this study. This information was used to develop individual competency lists in floriculture, landscaping, nursery and greenhouse, and vegetable and fruit production that were included in the first round of the horticulture survey. All competencies from other states were listed in the initial surveys.

The surveys also asked respondents to rate SCANS as they related to the individual occupational-specific competencies listed. SCANS were considered to be an integral part of the occupation-specific competencies and were rated using a Likert-type scale.

Home Economics - Child Care

A literature review was conducted to determine which states have occupational courses in Child Care. Seventeen states were identified: Alabama, Alaska, California, Colorado, Connecticut, Louisiana, Maine, Maryland, Massachusetts, New York, North Carolina, Ohio, Oklahoma, Tennessee, Utah, Virginia, and Wisconsin. A curriculum specialist and State Directors added New Mexico and Oregon.

A telephone survey was developed so that similar questions would be posed for each call. (See Appendix I) Nineteen state directors were contacted and were asked to send copies of validated competencies used in child care occupations curriculum. Twelve state directors responded. These twelve listings were compared to the Child Development Associate (CDA) credentials and to competencies validated in the Texas 2+2 Tech Prep Early Childhood Professions I & II curriculum (Patton & Harriman, 1991).

Competencies in the 2+2 Tech Prep Early Childhood Professions (Patton & Harriman, 1991) had been generated from several state and national sources. The competencies were validated by survey participants who represented directors of child care centers, and teachers of child development in Texas high schools and colleges. The 208 respondents identified the competencies as necessary for the position of child care assistant, preschool teacher, and administrator. The validated competencies then were reviewed by the 2+2 Child Development Steering Committee, and placed at the appropriate levels for secondary (grades 11 and 12) or postsecondary. After validation of the competencies, a competency based curriculum was developed. It was organized around the seven competency areas nationally recognized as basic to appropriate care and education for young children: Professionalism, Human Growth, Guidance, Curriculum, Family/Community, Safety/Health, and Program Management.

The Early Childhood Professions competencies were selected as the basis for this project because they had been validated by business and industry representatives in 1991 and they also represented programs at two levels, secondary and postsecondary.

The basic employability skills, (SCANS) divided into eight (8) areas of competencies (5) and foundation skills (3) were incorporated into the Early Childhood Professions competencies to determine what emphasis should be placed on each SCANS employability skill during instruction.

Horticulture Surveys

Sample

A purposeful sample group of 54 business and industry leaders was chosen to represent the four fields of horticulture (floriculture, landscaping, nursery and greenhouse, and vegetable and fruit production) in locations throughout the state. The Texas Nurseryman's Association, The Texas Florist Association, and The Texas Citrus and Vegetable Association provided information needed to select the sample; it was from their membership lists that the names of the individuals in the sample group were chosen. A sample of 14 businesses in the areas of landscaping, fruit and vegetable production, and nursery and greenhouse production was chosen and a sample of 12 businesses in floriculture was also selected.

First Round Instrumentation

Four questionnaires were used in the first round of this study (Appendix B.1, Appendix C.1, Appendix D.1, and Appendix E.1). Each survey was specifically designed for one of the four selected areas of the horticultural industry. The surveys were focused to specific occupations by including only the competencies relevant to that area of horticulture. This was done to increase the response rate. The surveys were also designed to obtain consensus among group members regarding identified competencies.

Using the review of literature, which included lists of horticultural competencies gathered from other states, four lists of horticultural competencies were developed. The states from which information was obtained included Alabama, Alaska, Arizona, Florida, Illinois, Montana, Oklahoma, Ohio, Pennsylvania, South Carolina, and Wisconsin.

The first round instrument was divided into three major sections. The first section consisted of demographic information relating to the respondents. Each respondent was asked to give information concerning: what type of business or employment, the name and address of the business, number of employees, years of experience in horticulture, and position or title. The second section contained a list of occupational specific competencies for each identified area of horticulture.

The final section of the survey listed general employability skills that are consistent throughout all occupations. In the survey, general employability skills were differentiated from the occupation-specific competencies by using Roman numerals. They had been previously identified through the Secretary's Commission on Achieving Necessary Skills (SCANS) report that was published in 1992. Participants were asked to rate the SCANS skills as they applied to the horticulture-specific competencies.

The representatives were asked to rate each of the occupation specific competencies and general employability skills listed on the following Likert-type scale:

4 - Very Important

3 - Important

2 - Somewhat Important

1 - Not Important

There were spaces provided for additional suggestions and comments under each of the major headings in the occupation-specific section of the survey. Respondents were also asked to rate any additional suggestions on the above scale.

First Round Data Collection

Using the membership lists provided by the Texas Nurseryman's Association, the Texas Florist Association, and the Texas Citrus and Vegetable Association, individuals were telephoned and asked if they would be interested assisting with this study by filling out a survey. A cover letter, instrument, and self-addressed, stamped return envelope were mailed to the sample group in the areas of landscaping greenhouse and nursery production, floriculture, and fruit and vegetable production. A reminder notecard was sent to all non-respondents three weeks later. Phone calls were made to any participants who had not yet responded. Anyone who had not responded by January 1, 1994 was replaced using the original sample list. The first round response rates in the areas of floriculture, landscaping, nursery and greenhouse, and vegetable and fruit production were 91.6%, 85.7%, 71.4% and 50.0%, respectively.

Second Round Instrumentation

Questionnaires were developed for three areas of horticulture for the second round of the Delphi survey (Appendix B.2, Appendix C.2, and Appendix D.2). These areas were floriculture, nursery and greenhouse production, and landscaping. Because of an inadequate first round response rate, fruit and vegetable production was not included in the second round of the survey. Again, each survey was individualized for the specific areas of horticulture by including only those competencies which would be relevant to that area. General employability, or SCANS, skills were also included in the second round of the Delphi survey for this research.

Using the data analyzed from the first round responses, each instrument indicated all of the initial competencies (horticulture-specific and SCANS) that had been validated by the first round respondents for that specific area of horticulture. The second round instrument also listed which of the initial competencies were discarded by the first round respondents.

Those competencies which did not reach a consensus of either validation or discarding by 80% or more of the respondents in the first round survey were listed and respondents were asked to re-rate each competency. The same Likert-type scale was used for both rounds of this research:

4 - Very Important
3 - Important
2 - Somewhat Important
1 - Not Important

For each competency that was listed to be re-rated in the second round survey, the average answer from the first round was given as well as the individual's first round response. The respondents were asked to explain their second round answer if it was different from the first round average. Any new competencies from the first round were also added to the competency list for the respondents to rate using the above Likert-type scale.

Second Round Data Collection

A second round instrument and cover letter, and self-addressed, stamped envelope were mailed to all of the participants who responded to the first round of this survey. There were 11 floriculture surveys, 12 landscaping surveys, and 10 nursery surveys mailed.

The cover letter gave instructions and explained the purpose of the second round and was printed on departmental letterhead. This letter was also signed by the researcher and thesis chairperson. Respondents were asked to return the survey by March 15, 1994. Reminder postcards were mailed to all respondents on March 1, 1994. The second round response rates for the areas of floriculture, landscaping, and nursery and greenhouse were 63.6%, 83.3%, and 90%, respectively.

Summary

This was a descriptive study conducted using the a modified Delphi technique. A purposeful sample of individuals was surveyed to rate the importance of general employability skills (SCANS) and specific competencies in horticultural occupations using a Likert-type scale. The survey consisted of two rounds.

Data were analyzed according to the percent of different ratings for each occupation-specific competency and general employability skill listed. Competencies were either validated as needed for entry-level positions or were discarded as not important.

Child Care Surveys

Sample

Teachers of occupational Child Care classes in Texas were contacted to identify the child care facilities used as training sites for high school students. The telephone survey of thirty-one (31) teachers revealed fifteen (15) teachers using community facilities as training sites. The other 16 used on-site centers or an elementary school. A corporate child care mailing list was secured from the Texas Work & Family Clearinghouse. Additional locations were secured from telephone yellow pages listing of child care facilities.

The purposeful sample was drawn from directors and owners of child care facilities in Texas. Selected facilities included corporate child care providers, public and private child care providers, nationally accredited child care providers, and selected providers used as training stations for job-specific high school child care classes. The panel of experts who responded to the Delphi survey included twenty-four (24) child care facilities in Texas representing the following areas:

The 13 secondary respondents were corporate (4), random selections (5), teacher-selected sites at religious facilities (3), teacher-selected sites at private facilities (1). Texas cities included Grand Prairie, Jacksonville, Fort Worth, Grapevine, San Angelo, Bryan, Abilene, El Paso, Levelland, Midland, and Muleshoe.

The 11 postsecondary respondents were corporate (4), random selections (2), teacher-selected sites at religious facilities (2), teacher-selected sites at private facilities (1), religious facilities (1), and sites accredited by the National Association for the Education of Young Children (1). Cities included Dallas, Houston, Bellville, Galveston, Del Rio, Lubbock, Austin, and Wolfforth.

Pilot Testing of Instrument

Two types of instruments were developed initially: one type included only one level (secondary OR postsecondary) per instrument and the other, both levels (secondary AND postsecondary) on one instrument. Both instruments were pilot tested (eleven of each type) with child care directors and teachers at five local sites. Based on the pilot test, the single level instrument was selected for use in the study.

The Employability Skills Questionnaire: Child Care I was the instrument used during Round One of the study at both the secondary and postsecondary levels. The Employability Skills Questionnaire: Child Care II was used during Round Two of the study at both the secondary and postsecondary levels.

First Round Instrumentation

Two questionnaires were used in the first round of this study (Appendix F.1 and Appendix G.1) One survey was designed for the secondary level competencies with the other addressing the postsecondary level competencies.

The first round instrument was divided into three major sections. The first section consisted of demographic information relating to the respondents. Each respondent was asked to give information concerning: years of experience, position title, type of facility, child enrollment, numbers of teachers employed and educational background of employees. The second section contained the questionnaire. The final section consisted of reference materials including the Early Childhood Professions competencies and a brief explanation of SCANS.

The respondents were asked to rate each of the competencies and employability skills using the Likert-type scale of:

4 - Very Important

3 - Important

2 - Somewhat Important

1 - Not Important

First Round Data Collection

The survey packet, consisting of a cover letter, instrument, listing of Child Care competencies and SCANS employability skills and self-addressed, stamped return envelope, were mailed to a total of 96 respondents--48 addressing competencies at the secondary level and 48 addressing competencies at the postsecondary level. After extensive follow-up of postcards and telephone reminders, eighteen (18) secondary and fifteen (15) postsecondary questionnaires were returned for a return rate of 37% and 31%, respectively. Responses to the secondary questionnaire represented three major areas in Texas: Dallas/Fort Worth, Bryan, and Far West Texas. The postsecondary questionnaire was returned by directors from Dallas, Houston, Del Rio and Far West Texas. The responses represented corporate-sponsored, private, church-sponsored, nationally accredited, public, and teacher-selected child care facilities.

Second Round Instrumentation

Questionnaires were developed for the two levels of Child Care for the second round of the Delphi survey (Appendix F.4, Appendix G.4). Using the data analyzed from the first round responses, each instrument indicated all of the initial competencies that had been validated (reached consensus) during the first round. The respondents were asked to rate those items that did not reach consensus by comparing their individual first round rating to the mean and then re-rating the item. If the new rating was more than one rating point from the mean,

the respondents were asked to explain the rating beside the item. The same Likert-type scale of 1 (not important) to 4 (very important) was used for both second round instruments.

Second Round Data Collection

The second round instrument was designed based on the consensus reached during the first round. A cover letter, the instrument, listings of Child Care competencies and SCANS employability skills, a small incentive, and a self-addressed, stamped envelope were included in the survey packet. Thirteen (13) questionnaires were returned in each level. The return rate for the second round was 13 or 72% at the secondary level and 13 or 87% at the postsecondary level.

Third Round Instrumentation

The Employability Skills Questionnaire: Child Care III was used during Round Three at both the secondary and postsecondary levels.

The respondents were asked to rate each of the competencies and employability skills using the Likert-type scale of:

4 - Very Important
3 - Important
2 - Somewhat Important
1 - Not Important

Questionnaires were developed for the two levels of Child Care for the third round of the Delphi survey (Appendix G.5, Appendix H.5). Using data analyzed from the second round responses, each instrument indicated only the competencies that had not reached consensus during the second round. Sixteen competencies at the secondary level and 34 competencies at the postsecondary level were included in the respective questionnaires. The respondents were asked to rate the items by comparing their individual second round rating to the mean and then re-rating the item. The same Likert-type scale of 1 (not important) to 4 (very important) was used for both third round instruments.

Third Round Data Collection

The third round instrument was designed based on the consensus reached during the second round. A cover letter, the instrument, listings of Child Care competencies and SCANS employability skills, a small incentive, and a self-addressed envelope were included in the survey packet. Thirteen (13) secondary questionnaires were returned (100%). Eleven (11) postsecondary questionnaires were returned (85%).

Data Analysis Procedures

Horticulture

All first round responses were analyzed using an EXCEL 4.0 spreadsheet program on a Macintosh microcomputer. Data were analyzed to determine the percentage of different responses for each competency listed. The mean response for each competency was also computed.

Using the percentage of responses for each rating, competencies were divided into three categories. Validated competencies were those competencies which received a "Very Important" or "Important" rating by 80% or more of the respondents. These competencies were included in the Validated Horticulture Competency List for Texas' Secondary Schools (Appendix F). Discarded competencies were those competencies which 80% or more of the respondents rated as "Somewhat Important or "Not Important". The final category of competencies were "Second Round" competencies. These competencies were neither validated nor discarded by 80% or more of the first round respondents

The data from all second round responses was analyzed using an EXCEL 4.0 spreadsheet program on a Macintosh microcomputer. Data were analyzed to determine the percentage of different responses for each competency listed. The mean response for each competency was also figured.

If 70% of the second-round respondents rated the competency as "Very Important" or "Important", it was added to the validated competency list. Competencies rated as "Somewhat Important" or "Not Important" by 70% or the second round respondents were discarded.

Child Care

The review of relevant research on the Delphi technique revealed that there was no standard definition of consensus associated with the technique. The definition of consensus in previous studies ranged from 65% to 90% agreement (Glosson, 1979). For the purposes of this study, consensus was determined to be 70% agreement for one rating or 80% agreement for 2 adjacent ratings on a scale from 4 (very important) to 1 (not important). Level of consensus, means, and importance ratings were determined for each of 252 items on both the secondary and postsecondary questionnaires. Consensus was reached on 178 secondary and 176 postsecondary items during the first round of the Delphi. The new instruments designed for round two and round three contained only the nonconsensus items.

CHAPTER III
ANALYSIS AND INTERPRETATION OF RESEARCH RESULTS

Horticulture

First Round Survey Results

On January 15, 1994, all collected data was analyzed. A spreadsheet program (EXCEL 4.0) on a Macintosh microcomputer was used to determine the mean and frequency of each response for the individual competency listed. Any competency which received a rating of "Very Important" or "Important" by at least 80% of the respondents was chosen as part of the validated competency list. Those competencies which received a rating of "Somewhat Important" or "Not important" by 80% of the respondents were deleted from the validated list. Some of the competencies, however, did not meet either requirement. These competencies were included in the second round of the survey, and respondents were asked to re-rate them in an effort to reach consensus.

When the data were analyzed, only seven of the fourteen fruit and vegetable production businesses had responded. Numerous phone calls to other businesses in the same area of horticulture found no one that was interested in being part of the project or completing the survey. Because of this lack of response, the fruit and vegetable production area of horticulture was deleted from the remainder of this study. The exact reason for the lack of interest and support in this project is not known.

Of the twelve florists sampled, eleven returned completed surveys. This resulted in a 91.6 first round response rate. Three competencies were identified by the sample as being unimportant for secondary students to know and were discarded from the validated list. (Eighty percent of the respondents found them to be somewhat important or not important.) "Understands plant propagation" was identified as being unimportant by more than 90% of the respondents. Two additional competencies ("Prepares soil and media mixes" and "Prepares advertisements" were discarded by over 80% of the respondents. Table 3.H1 lists these competencies that were discarded from the competency list and the percentage of respondents who found them "Somewhat Important" or "Not Important".

Table 3.H1: Floriculture Competencies Discarded from Validated List by Participants of the First Round Survey

Floriculture Competencies	Percentage of "Somewhat" or "Not" Important Responses
Understands plant propagation	90.9
Prepares soil and media mixes	81.8
Prepares advertisements	80.0

Seventeen competencies did not fit either of the criteria and were included in the second round of this survey to be re-rated. Six of these competencies were rated as "Important or "Very Important" by more than 70% of the respondents. They included: "Identifies plants by common and scientific name," "Produces a silk flower arrangement," "Constructs wedding nosegays," "Constructs wedding arrangements," Interprets technology", and "Applies technology". Nine competencies were rated as "Important" or "Very Important" by 60-69% of the respondents. They were: "Fertilizes plants as needed," "Maintains current inventory," "Makes various types of boutonnieres," Makes various types of corsages," "Diagnoses and controls plant pest problems," "Personnel management," "Mediates decision making", "Improves and/or designs systems", and "Evaluates technology". Two competencies were rated as "Important" or "Very Important" by 21- 59% of the respondents. They were "Produces a dry flower arrangement" and "Processes information with computers". The competencies that needed to be included in the second round of the survey and the percentage of respondents who rated them as "Very Important" or "Important" are identified in Table 3.H2.

Table 3.H2: Floriculture Competencies Identified by Participants in the First Round Survey to be Included in the Second Round Survey.

Floriculture Competencies	Percentage of "Very Important" or "Important" Responses
Identifies plants by common and scientific name	72.7
Produces a silk flower arrangement	72.7
Constructs wedding arrangements	72.7
Constructs wedding nosegays	72.7
Interprets technology	70.0
Applies technology	70.0
Makes various types of corsages	63.6
Maintains current inventory	63.6
Makes various types of boutonnieres	63.6
Fertilizes plants as needed	63.6
Personnel management	60.0
Diagnoses and controls plant pest problems	60.0
Mediates decision making	60.0
Improves and/or designs systems	60.0
Evaluates technology	60.0
Produces a dry flower arrangement	54.5
Processes information with computers	40.0

Ten of the fourteen nursery and greenhouse businesses returned surveys resulting in 71.4% response rate. Twelve of the original competencies were discarded (identified as "Somewhat Important" or "Not Important" by 80% or more of the respondents) after the first round of the survey. Three skills were discarded by 100% of the respondents. They were:

"Harvests cut flowers," "Prepares and places cut flowers in water," and "Harvests bulbs". Two competencies were discarded by 90% of the respondents. They included "Adds mulch" and "Grows small fruit and nuts" Seven competencies were discarded by 80% of the respondents. They were: "Tests soil, water, and plant tissues," "Prepares soil and media mixes," "Plants bulbs," "Plants seeds," "Plants shrubs and trees," "Digs, balls, and burlaps shrubs and trees," and "Forces potted bulbs". All of these competencies were stricken from the validated competency list. They are identified in Table 3.H3.

Table 3.H3: Nursery & Greenhouse Competencies Discarded from Validated List by Participants in the First Round Survey

Nursery & Greenhouse Competencies	Percentage of "Somewhat" or "Not" Important Responses
Harvests cut flowers	100.0
Harvests bulbs	100.0
Prepares and places cut flowers in water	100.0
Adds mulch	90.0
Grows small fruits and nuts	90.0
Digs, balls, and burlaps shrubs and trees	80.0
Forces potted bulbs	80.0
Plants bulbs	80.0
Plants seeds	80.0
Plants shrubs and trees	80.0
Prepares soil and media mixes	80.0
Tests soil, water, and plant tissues	80.0

Thirty-seven competencies were identified as very important or important by more than 80% of the respondents. Thirty-three identified competencies did not meet either criteria and were included in the second round of the survey. Five additional competencies that were suggested in the first round of responses were also included in the second round of the nursery and greenhouse survey. The following competencies were rated as "Important" of "Very Important" by 70-79% of the respondents: "Selects and prepares plants for sale," "Creative thinking," "Mediates decision making,", "Supply and equipment management", and "Money management". Five skills were rated as "Important" or "Very Important" by 60-69% of the respondents. These competencies included: "Labels planted specimens," "Prepares plants for display," "Plans and controls for weeds," "Applies technology," and "Social Correctness". Fourteen competencies received an "Important" or "Very Important" rating by 50-59% of the respondents. These competencies were: "Maintains proper temperature," "Applies appropriate fertilizers," "Identifies plants by common and scientific name," "Repairs equipment and facilities," "Operates necessary equipment," "Writes up customer orders," "Grows container nursery stock," "Grows various crops," "Prepares estimates," "Sleeves plants," "Attaches care cards to plants," "Takes orders by phone and/or fax", "Improves and/or designs systems," and

"Interprets technology". 40-49% of the respondents rated nine competencies as "Important" or "Very Important". These competencies were: ""Demonstrates understanding of the nursery industry," "Applies rooting hormones," "Removes rooted cuttings," "Pinches plants," "Sticks cuttings for rootings," "Processes information with computers," "Monitors and corrects performance," "Personnel management," "and "Evaluates technology". All thirty-eight skills are listed in Table 3.H4. Percentages of respondents who classified the skills as very important or important are noted for original items and the additional competencies are identified as "new".

Table 3.H4: Nursery & Greenhouse Competencies Identified by Participants in the First Round Survey to be Included in the Second Round Survey

Nursery & Greenhouse Competencies	Percentage of "Very Important" or "Important" Responses
Selects and prepares plants for sale	77.7
Creative thinking	70.0
Mediates decision making	70.0
Money management	70.0
Supply and equipment management	70.0
Labels planted specimens	66.6
Prepares plants for display	66.6
Plans and controls for weeds	66.6
Applies technology	60.0
Social correctness	60.0
Maintains proper temperature	55.5
Applies appropriate fertilizers	55.5
Identifies plants by common and scientific name	55.5
Repairs equipment and facilities	55.5
Operates necessary equipment	55.5
Writes up customer orders	55.5
Grows container nursery stock	55.5
Grows various crops	55.5
Prepares estimates	55.5
Sleeves plants	55.5
Attaches care cards to plants	55.5
Takes orders by phone and fax	55.5
Improves and/or designs systems	50.0
Interprets technology	50.0
Demonstrates understanding of the nursery industry	44.4
Applies rooting hormones	44.4
Removes rooted cuttings	44.4
Pinches plants	44.4
Sticks cuttings for rootings	44.4
Process information with computers	40.0
Monitors and corrects performance	40.0
Personnel management	40.0
Evaluates technology	40.0
Controls pathogens and diseases	*NEW*
Uses available information to act as a consultant	*NEW*
Sanitation	*NEW*

Twelve of the fourteen landscaping businesses sampled returned surveys for an 85.7% response rate. Only three competencies were rated as "Somewhat Important" or "Not Important" by 80% or more of the respondents and were deleted from the validated list. Table 3.H5 shows the percentage of respondents who rated them as somewhat important or not important. 100% of the respondents rated "Propagates plants" as "Somewhat" or "Not Important". 91% of the respondents discarded "Tests soil, water, and plant tissues" from the validated list and 83% discarded "Uses color to enhance finished plans.

Table 3.H5: Landscaping Competencies Discarded from Validated List by Participants of the First Round Survey

Landscaping Competencies	Percentage of "Somewhat" or "Not" Important Responses
Propagates plants	100.0
Test soil, water, and plant tissues	91.0
Uses color to enhance finished plans	83.0

For thirty of the initial competencies listed, the respondents did not reach a consensus on validation for the list or exclusion from the list. These competencies and one additional skill which was suggested from the first round were included in the second round of the landscaping survey. These skills are listed in table 3.H6. The percentage of respondents who listed them as important or very important is also given.

Table 3.H6: Landscaping Competencies Identified by Participants in the First Round Survey to be Included in the Second Round Survey

Landscaping Competencies	Percentage of "Very Important" or "Important" Responses
Social correctness	75.0
Draws landscape and irrigation plans to scale	75.0
Prepares plans for blueprinting and presentation	75.0
Identifies basic principles of landscape design	75.0
Receives and delivers landscape products	75.0
Prepares location to be landscaped	75.0
Prepares media mixes	75.0
Applies appropriate fertilizers - exterior landscape	75.0
Plans and controls for weeds	72.0
Plans and controls for pests	72.0
Plans and controls for diseases	72.0
Understands landscaping and turf industries	72.0
Prepares estimates and established contracts	72.0
Identifies plant requirements and value	66.0
Selects and locates appropriate complements	66.0
Repairs equipment	66.0
Evaluates technology	66.0
Applies appropriate fertilizers - turf	63.0
Processes information with computers	63.0
Repairs equipment	63.0
Designs and sells landscape projects	63.0
Uses and maintains price lists and catalogs	63.0
Manages business finance	63.0
Develops bid for landscape job	58.0
Harvest, transport, and deliver landscape material	58.0
Interprets technology	58.0
Applies technology	58.0
Identifies plants by common and botanical name	58.0
Makes sketches suitable for client evaluation	50.0
Identifies drafting equipment	42.0

Second Round Survey Results

On April 10, 1994, all data from the second round surveys were analyzed. The mean and frequency of each response was determined for each occupation-specific competency and employability skill listed. Any competency or skill that received a "Very Important" or "Important" rating from 70% or more of the second round respondents was included in the validated competency list. Any competency which did not meet this criteria was discarded from the final validated competency list. Each of the three areas of horticulture included in the second round of the survey have an individual validated competency list for that specific occupation.

Of the eleven florists sampled in the second round, seven returned surveys. This resulted in a 63.6% response rate for the second round of the floriculture survey. An additional sixteen competencies and employability skills were rated as "Very Important" or "Important" by 70% or more of the respondents and were added to the initial validated list. Table 3.H7 lists these competencies and their corresponding percentages. "Interprets technology" was validated by 100% of the second round respondents. Six competencies were validated by 85% of the second round respondents. These competencies were: "Produces a silk flower arrangement," "Makes various types of corsages," "Constructs wedding nosegays," "Personnel management," "Applies technology," and "Evaluates technology." "Processes information with computers" was the only competency from the second round survey that was discarded from the validated competency list.

Table 3.H7 Floriculture Competencies Validated by the Participants in the Second Round Survey

Floriculture Competencies	Percentage of Very Important or Important Responses
Interprets technology	100.0%
Applies technology	85.0%
Constructs wedding nosegays	85.0%
Evaluates technology	85.0%
Makes various types of corsages	85.0%
Personnel management	85.0%
Produces a silk flower arrangement	85.0%
Constructs wedding arrangements	71.0%
Diagnoses and controls plant pest problems	71.0%
Fertilizes plants as needed	71.0%
Identifies plants by common and scientific name	71.0%
Improves and/or designs systems	71.0%
Maintains current inventory	71.0%
Makes various types of boutonnieres	71.0%
Mediates decision making	71.0%
Produces a dry flower arrangement	71.0%

There was a 90% return rate on the second round of the Nursery and Greenhouse production survey with nine of the ten companies returning completed surveys. Thirty competencies were discarded by participants in the second round survey as they did not receive a "Very Important" or "Important" rating by at least 70% of the respondents. These competencies and their corresponding percentages are listed in Table 3.H8. Seven competencies received a "Very Important" or "Important" rating by 62-67% of the respondents. These competencies were: "Money management," "Social correctness," "Takes orders by phone and fax," "Applies appropriate fertilizers," "Controls pathogens and diseases," "Identifies plants by common and scientific name," and "Plans and controls for weeds." From 50-56% of the respondents rated eight competencies as "Very Important" or "Important."

These competencies included: "Creative thinking," "Personnel management," "Prepares estimates," "Supply and equipment," "Attaches care cards to plants," "Repairs equipment and facilities," "Sanitation," and "Transplants plants." Nine competencies were believed to be important by only 30-45% of the second round respondents. These competencies were: "Interprets technology," "Monitors and corrects performance," "Demonstrates understanding of the nursery industry," "Grows bedding plants," "Grows container nursery stock," "Grows various crops," "Evaluates technology," "Improves and/or designs systems," and "Processes information with computers." The remaining six competencies received a "Very Important" or "Important" rating from 12-25% of the second round respondents. These competencies included: "Applies rooting hormones," "Maintains proper temperature," "Pinches plants," "Removes rooted cuttings," "Sleeves plants," and "Sticks cuttings for rootings."

Table 3.H8: Nursery and Greenhouse Competencies Discarded by Participants in the Second Round Survey

Nursery & Greenhouse Competencies	Percentage of Very Important or Important Responses
Money management	66.6%
Social correctness	66.6%
Takes orders by phone and fax	66.6%
Applies appropriate fertilizers	62.5%
Controls pathogens and diseases	62.5%
Identifies plants by common and scientific name	62.5%
Plans and controls for weeds	62.5%
Creative thinking	55.5%
Personnel management	55.5%
Prepares estimates	55.5%
Supply and equipment management	55.5%
Attaches care cards to plants	50.0%
Repairs equipment and facilities	50.0%
Sanitation	50.0%
Transplants plants	50.0%
Interprets technology	44.4%
Monitors and corrects performance	44.4%
Demonstrates understanding of the nursery industry	37.5%
Grows bedding plants	37.5%
Grows container nursery stock	37.5%
Grows various crops	37.5%
Evaluates technology	33.3%
Improves and/or designs systems	33.3%
Process information with computers	33.3%
Applies rooting hormones	25..0%
Maintains proper temperature	25.0%
Pinches plants	25.0%
Removes rooted cuttings	25.0%
Sleeves plants	12.5%
Sticks cuttings for rootings	12.5%

Eight competencies were validated by participants in the second round survey as being important for entry-level positions. These competencies and the percent of respondents who rated them as "Very Important" or "Important" are listed in Table 3.H9. Four competencies were rated as "Very Important" or "Important" by 87-89% of the second round respondents. These competencies were: "Applies technology," "Mediates decision making," "Uses available information to act as a consultant," and "Selects and prepares plants for sale." Four more competencies were validated by 75-78% of the second round respondents. These competencies included: "Writes up customer orders," "Labels planted specimens," "Operates necessary equipment," "Prepares plants for display."

Table 3.H9: Nursery and Greenhouse Competencies Validated by Participants in the Second Round Survey

Nursery & Greenhouse Competencies	Percentage of Very Important or Important Responses
Applies technology	88.8%
Mediates decision making	88.8%
Uses available information to act as a consultant	88.8%
Selects and prepares plants for sale	87.5%
Writes up customer orders	77.7%
Labels planted specimens	75.0%
Operates necessary equipment	75.0%
Prepares plants for display	75.0%

There was a 83.3% return rate on the second round of the Landscaping survey. Ten of the twelve businesses participating returned surveys. Of the thirty competencies rated in the second round of the landscaping survey, only three were discarded as being unimportant for entry-level positions. These three competencies and their corresponding percentages are listed in Table 3.H10. Two competencies, "Identifies drafting equipment" and "Interprets technology", were rated as "Very Important" or "Important" by 40% of the second round respondents. "Evaluates technology" was also discarded as it was rated "Very Important" or "Important" by only 30% of the second round respondents.

Table 3.H10: Landscaping Competencies Discarded by Participants in the Second Round Survey

Landscaping Competencies	Percentage of Very Important or Important Responses
Identifies drafting equipment	40.0%
Interprets technology	40.0%
Evaluates technology	30.0%

Twenty-seven additional competencies were validated as being important for entry-level positions in landscaping occupations. These competencies and the percentage of second round

respondents who rated them as "Very Important" or "Important" are found in Table 3.H11. Four competencies were validated by 100% of the second round respondents. These competencies were: "Identifies basic principles of landscape design," "Identifies plants by common and botanical name," "Plans and controls for pests - turf," and "Prepares estimates and establishes contracts". Ninety percent of the second round respondents rated eleven competencies as being "Very Important" or "Important." These competencies included: "Applies appropriate fertilizers - exterior landscapes," "Draws landscape and irrigation plans to scale," "Draws legible plans," "Plans and controls for diseases - turf," "Plans and controls for weeds - turf," "Prepares location to be landscaped," "Prepares plans for blueprinting and presentation," "Processes information with computers," "Receives and delivers landscape products," "Selects and locates appropriate complements," and "Understands landscaping and turf industries." The remaining 12 competencies received a "Very Important" or "Important" rating by 70-80% of the second round respondents. These competencies were: "Applies appropriate fertilizers - turf," "Applies technology," "Designs and sells landscape projects," "Harvest, transport, and deliver landscape material," "Identifies plant requirements and value," "Manages business finance," "Prepares media mixes," "Repairs equipment," "Social correctness," "Uses and maintains price lists and catalogs," "Develops bid for landscape jobs," and "Makes sketches suitable for client evaluation."

Table 3.H11: Landscaping Competencies Validated by Participants in the Second Round Survey

Landscaping Competencies	Percentage of Very Important or Important Responses
Identifies basic principles of landscape design	100.0%
Identifies plants by common and botanical name	100.0%
Plans and controls for pests - turf	100.0%
Prepares estimates and establish contracts	100.0%
Applies appropriate fertilizers - exterior landscape	90.0%
Draws landscape and irrigation plans to scale	90.0%
Draws legible plans	90.0%
Plans and controls for diseases-turf	90.0%
Plans and controls for weeds-turf	90.0%
Prepares location to be landscaped	90.0%
Prepares plans for blueprinting and presentation	90.0%
Processes information with computers	90.0%
Receives and delivers landscape products	90.0%
Selects and locates appropriate complements	90.0%
Understands landscaping and turf industries	90.0%
Applies appropriate fertilizers - turf	80.0%
Applies technology	80.0%
Designs and sells landscape projects	80.0%
Harvest, transport, and deliver landscape material	80.0%
Identifies plant requirements and value	80.0%
Manages business finance	80.0%
Prepares media mixes	80.0%
Repairs equipment	80.0%
Social correctness	80.0%
Uses and maintains price lists and catalogs	80.0%
Develops bid for landscape job	70.0%
Makes sketches suitable for client evaluation	70.0%

Child Care

For the purpose of analysis of responses, consensus was defined as 70% of the respondents selecting one rating point (e.g. important) or 80% for two adjacent rating points (e.g. important and very important). At the secondary level, agreement was reached on 178 of the 252 items (71%) in the first round. At the postsecondary level, first round agreement was reached on 176 (70%) items. In the second round, agreement was reached on an additional 58 items at the secondary level and 42 items at the postsecondary level. This resulted in consensus on 94% of the secondary items and 87% of the postsecondary items. An additional 15 secondary and 33 postsecondary items reached consensus on the third round of the Delphi for 99.6% agreement on each instrument. Only one item at each level failed to reach consensus.

Secondary

The results of three rounds of the Delphi survey for secondary level competencies are reported in Table 3.CC1. One SCANS employability skills failed to reach consensus. The employability skill that failed to reach consensus was Manages Money in the competency of Human Growth. (See Table 3.CC2). Sixty-six items reached consensus at the 70% level (one rating point) and 185 items at 80% (two adjacent rating points). Of the 251 items reaching consensus, there was 100% agreement on 7 items. Three were in the Guidance area (Participates as Member of a Team, Negotiates, and Improves or Designs Systems), two in Human Growth (Monitors & Corrects Performance, and Improves or Designs Systems), and two in Professionalism (Serves Clients/Customers and Negotiates). When examined across SCANS categories, four items achieving 100% consensus were in the Interpersonal Skills category and three items were in the Systems category.

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Table 3.CC1

DELPHI SURVEY RESULTS: CHILD CARE/SECONDARY

EMPLOYABILITY SKILL	COMPETENCY						
	Professionalism	Guidance		Family/Community		Program Mgt.	
		Human Growth		Curriculum		Safety/Health	
RESOURCES							
1. Manages Time	83	77	77	72	80	80	83
2. Manages Money	85	77	92	92	77	92	93
3. Manages Material & Facilities	89	82	83	72	80	87	93
4. Manages Human Resources	83	77	85	77	85	77	87
INTERPERSONAL SKILLS							
5. Participates as Member of a Team	94	72	100	72	83	87	83
6. Teaches Others New Skills	89	83	89	89	87	87	93
7. Serves Clients/Customers	100	83	94	83	73	80	83
8. Exercises Leadership	83	92	92	92	80	77	80
9. Negotiates	100	85	100	92	77	92	85
10. Works with Diversity	89	89	94	94	87	92	80
INFORMATION							
11. Acquires & Evaluates Information	78	94	83	94	87	87	87
12. Organizes & Maintains Information	83	92	83	83	87	80	87
13. Interprets/Communicates Information	94	94	89	89	87	87	87
14. Uses Computers to Process Information	85	92	83	92	87	73	85
SYSTEMS							
15. Understands Systems	77	77	77	77	77	92	77
16. Monitors & Corrects Performance	89	100	92	82	92	92	87
17. Improves or Designs Systems	77	100	100	85	92	92	92
TECHNOLOGY							
18. Selects Technology	90	77	92	85	92	85	92
19. Applies Technology to Task	85	92	92	85	92	92	77
20. Maintains/Troubleshoots Equipment	92	85	88	92	85	85	85

Table 3.CC1 (Continued)

BASIC SKILLS							
21. Reading	89	72	72	89	93	93	93
22. Writing	89	89	94	83	93	93	93
23. Arithmetic/Mathematics	94	85	85	83	92	85	87
24. Listening	89	83	83	83	93	93	93
25. Speaking	89	89	94	78	93	93	93
THINKING SKILLS							
26. Creative Thinking	89	89	94	89	80	80	87
27. Decision Making	72	89	89	89	93	87	87
28. Problem Solving	83	72	94	89	93	87	93
29. Seeing Things in the Mind's Eye	89	83	89	89	85	92	87
30. Knowing How to Learn	83	72	89	94	93	93	93
31. Reasoning	78	89	94	94	93	93	93
PERSONAL QUALITIES							
32. Responsibility	94	78	78	83	93	93	93
33. Self-Esteem	89	78	78	83	93	87	93
34. Sociability	78	94	94	83	93	87	93
35. Self-Management	89	83	89	82	87	87	93
36. Integrity/Honesty	89	78	72	72	93	87	93

Note: Shadow = no consensus reached

Underline = consensus of one rating at 70% or more.

No underline - consensus of two adjacent ratings at 80% or more.

Table 3.CC2

Secondary Employability Skills and Competencies Not Reaching Pre-Established Levels of Consensus[a] (N=13)

EMPLOYABILITY SKILL	COMPETENCY	LEVEL OF CONSENSUS
Manages Money	Human Growth	77%

[a]Consensus=80% agreement for 2 adjacent ratings or 70% of one rating on a scale from 4 (very important) to 1 (not important)

Item mean scores were examined to determine the perceived importance of the SCANS employability skills relative to each of the seven child care competency areas. Item mean scores are reported in Table 3.CC3. Items achieving consensus with means of 2.5 or above were considered important. Two hundred thirty-six (94%) of the 251 items met this standard.

Table 3.CC3

IMPORTANCE OF EMPLOYABILITY SKILLS: CHILD CARE/SECONDARY

4=very important; 3=important; 2=somewhat important; 1=not important

COMPETENCY MEAN

EMPLOYABILITY SKILL	TOTAL	Professionalism		Guidance Family/Community		Program Mgt.		
		Human Growth		Curriculum		Safety/Health		
RESOURCES								
1. Manages Time	3.4	3.8	3.1	3.2	3.8	2.9	3.2	3.7
2. Manages Money	2.9	3.0	2.4	2.5	2.9	2.9	2.4	3.5
3. Manages Material & Facilities	3.4	3.6	3.1	3.1	3.7	3.1	3.5	3.7
4. Manages Human Resources	3.1	3.3	3.1	3.0	3.2	3.0	2.8	3.3
RESOURCES TOTAL MEAN	3.2	3.4	3.1	3.0	3.4	3.0	3.0	3.6
INTERPERSONAL SKILLS								
5. Participates as Member of a Team	3.7	3.7	3.6	3.6	3.7	3.7	3.5	3.9
6. Teaches Others New Skills	3.4	3.4	3.3	3.4	3.4	3.3	3.3	3.5
7. Serves Clients/Customers	3.6	**4.0**	3.4	3.6	3.2	3.7	3.4	3.9
8. Exercises Leadership	3.2	3.4	3.1	3.1	3.2	3.3	2.8	3.4
9. Negotiates	3.0	3.3	3.0	3.3	2.9	3.1	2.5	3.1
10. Works with Diversity	3.5	3.7	3.4	3.5	3.4	3.6	3.0	3.4
INTERPERSONAL TOTAL MEAN	3.4	3.6	3.3	3.4	3.3	3.5	3.1	3.5
INFORMATION								
11. Acquires & Evaluates Information	3.5	3.8	3.4	3.3	3.4	3.4	3.4	3.6
12. Organizes & Maintains Information	3.4	3.4	3.1	3.2	3.4	3.4	3.4	3.6
13. Interprets/Communicates Information	3.5	3.6	3.3	3.3	3.5	3.5	3.6	3.6
14. Uses Computers to Process Information	1.8	2.1	1.9	1.8	1.9	1.6	1.2	2.5
INFORMATION TOTAL MEAN	3.1	3.2	2.9	2.9	3.1	3.0	2.9	3.3
SYSTEMS								
15. Understands Systems	2.9	2.9	2.9	2.9	2.9	2.9	2.8	3.2
16. Monitors & Corrects Performance	3.4	3.5	3.3	3.2	3.2	3.3	3.4	3.6
17. Improves or Designs Systems	2.6	3.1	2.5	2.6	3.0	2.6	2.7	2.8
SYSTEMS TOTAL MEAN	3.0	3.2	2.9	2.9	3.0	2.9	3.0	3.2

TECHNOLOGY								
18. Selects Technology	2.5	2.6	2.3	2.4	2.6	2.5	2.2	2.7
19. Applies Technology to Task	2.7	2.9	2.5	2.5	3.0	2.6	2.4	2.8
20. Maintains & Troubleshoots Equipment	2.5	2.8	2.2	2.0	2.7	2.4	2.5	2.8
TECHNOLOGY TOTAL MEAN	2.6	2.8	2.3	2.3	2.8	2.5	2.4	2.8
BASIC SKILLS								
21. Reading	3.8	3.9	3.8	3.8	3.9	3.7	3.6	3.9
22. Writing	3.8	3.9	3.6	3.7	3.9	3.7	3.6	3.9
23. Arithmetic/Mathematics	3.3	3.6	3.1	3.1	3.5	3.2	2.9	3.6
24. Listening	3.9	3.9	3.9	3.9	3.8	3.9	3.9	**4.0**
25. Speaking	3.8	3.9	3.6	3.6	3.8	3.9	3.6	3.9
BASIC SKILLS TOTAL MEAN	3.7	3.8	3.6	3.6	3.8	3.7	3.4	3.9
THINKING SKILLS								
26. Creative Thinking	3.5	3.8	3.5	3.6	3.6	3.3	3.2	3.6
27. Decision Making	3.5	3.7	3.5	3.4	3.4	3.5	3.4	3.7
28. Problem Solving	3.7	3.8	3.7	3.6	3.6	3.7	3.8	3.9
29. Seeing Things in the Mind's Eye	3.3	3.5	3.3	3.4	3.4	3.1	3.1	3.3
30. Knowing How to Learn	3.7	3.8	3.8	3.6	3.7	3.5	3.6	3.9
31. Reasoning	3.6	3.7	3.5	3.6	3.6	3.6	3.7	3.8
THINKING SKILLS TOTAL MEAN	3.6	3.7	3.6	3.5	3.6	3.5	3.5	3.7
PERSONAL QUALITIES								
32. Responsibility	3.9	3.9	3.8	3.8	3.9	3.9	3.9	**4.0**
33. Self-Esteem	3.7	3.8	3.8	3.8	3.6	3.7	3.4	3.7
34. Sociability	3.6	3.7	3.7	3.6	3.4	3.7	3.5	3.6
35. Self-Management	3.6	3.8	3.5	3.6	3.4	3.6	3.6	3.9
36. Integrity/Honesty	3.8	3.9	3.8	3.8	3.7	3.9	3.7	3.9
PERSONAL QUALITIES TOTAL MEAN	3.7	3.8	3.7	3.7	3.6	3.8	3.6	3.8

>Mean underlined indicates skills considered not important, less than 2.5.

>Mean shadowed indicates no consensus reached.

>Consensus defined as 70% for 1 score or 80% for 2 adjacent scores.

>**Bold**=4.0 (very important)

Results indicated that when examined by SCANS categories, Basic Skills and Personal Qualities with means of 3.7 were perceived as most important. Means for the other categories were: Thinking Skills (3.6), Interpersonal Skills (3.4), Resources (3.2), Information (3.1), Systems (3.0), and Technology (2.6).

In three categories, Basic Skills, Personal Qualities, and Thinking Skills, all items reaching consensus had mean scores of 3.0 or above, suggesting that respondents perceived each skill to be either "important" or "very important." In two other categories, all means were 2.5 or above: Interpersonal Skills and Systems. The percentages of items with means of 2.5 or above in the other SCANS categories were Resources (96%), Information (79%), and Technology (67%).

The most important employability skills as shown by overall item means (across seven competency areas) were Listening (Basic Skills) and Responsibility (Personal Qualities). Both items had overall means of 3.9. The least important skill was Uses Computers to Process Information (x = 1.8). Three individual SCAN skills had item means of 4.0. These were Serves Clients/Customers in the competency area of Professionalism, and Listening and Responsibility in the area of Program Management. The least important individual SCAN skill was "Uses Computers to Process Information" as indicated by item means of less than 2.0 in five of the seven competency areas. These items are identified in Table 3.CC3.

When examined by competency areas, there was little variation in the perceived importance of SCANS employability skills. As noted in Table 3.CC4, the range of means was less than one point in each category. For Thinking Skills and Personal Qualities the means were almost identical across competency areas.

Table 3.CC4

Mean Summary of Employability Skills: Child Care/Secondary

4=very important; 3=important; 2=somewhat important; 1=not important

EMPLOYABILITY SKILL	COMPETENCY MEAN							
	TOTAL	Professionalism	Human Growth	Guidance	Curriculum	Family/Community	Safety/Health	Program Mgt.
RESOURCES	3.2	3.4	3.1	3.0	3.4	3.0	3.0	3.6
INTERPERSONAL SKILLS	3.4	3.6	3.3	3.4	3.3	3.5	3.1	3.5
INFORMATION	3.1	3.2	2.9	2.9	3.1	3.0	2.9	3.3
SYSTEMS	3.0	3.2	2.9	2.9	3.0	2.9	3.0	3.2
TECHNOLOGY	2.6	2.8	2.3	2.3	2.8	2.5	2.4	2.8
BASIC SKILLS	3.7	3.8	3.6	3.6	3.8	3.7	3.4	3.9
THINKING SKILLS	3.6	3.7	3.6	3.5	3.6	3.5	3.5	3.7
PERSONAL QUALITIES	3.7	3.8	3.7	3.7	3.6	3.8	3.6	3.8
GRAND MEAN	3.3	3.4	3.2	3.2	3.3	3.2	3.1	3.5

Postsecondary

The results of three rounds of the Delphi survey for postsecondary level competencies are reported in Table 3.CC5. Thirty-four SCANS employability skills did not reach consensus at the postsecondary level at the end of the second round of Delphi. At the end of the third round only one item (Manages Time in Human Growth) failed to reach consensus, as identified in Table 3.CC6. One hundred six items reached consensus at the 70% level (one rating point) and 145 items at 80% (two adjacent rating points). Of the 251 items reaching consensus, there was 100% agreement on 27 items. Eleven were in the Professionalism competency area, five in Health/Safety, four in Family/Community, three in Human Growth, two in Curriculum, and one each in Guidance and Program Management competency areas. When examined across the SCANS categories, six were in the employability skills category of Information, five each in Personal Qualities and Thinking Skills, four in Interpersonal Skills, three in Basic Skills, and two each in Systems and Technology.

Table 3.CC5

DELPHI SURVEY RESULTS: CHILD CARE/POSTSECONDARY

COMPETENCY

EMPLOYABILITY SKILL	Professionalism	Human Growth	Guidance	Curriculum	Family/Community	Safety/Health	Program Mgt.
RESOURCES							
1. Manages Time	80	73	92	87	80	85	87
2. Manages Money	80	91	73	91	82	91	92
3. Manages Material & Facilities	87	92	80	73	80	92	93
4. Manages Human Resources	80	87	92	92	80	92	87
INTERPERSONAL SKILLS							
5. Participates as Member of a Team	100	80	73	87	87	73	87
6. Teaches Others New Skills	80	87	80	85	93	87	93
7. Serves Clients/Customers	87	87	87	80	100	80	87
8. Exercises Leadership	100	82	91	92	92	92	73
9. Negotiates	100	92	87	82	93	82	80
10. Works with Diversity	73	93	87	73	80	82	93
INFORMATION							
11. Acquires & Evaluates Information	73	100	80	100	87	100	73
12. Organizes & Maintains Information	100	87	87	73	80	100	87
13. Interprets/Communicates Information	87	100	73	73	73	93	73
14. Uses Computers to Process Information	73	91	87	91	73	91	82
SYSTEMS							
15. Understands Systems	80	91	91	82	82	91	100
16. Monitors & Corrects Performance	73	87	80	80	92	80	73
17. Improves or Designs Systems	100	92	91	82	85	92	80
TECHNOLOGY							
18. Selects Technology	91	82	85	92	92	92	80
19. Applies Technology to Task	85	73	91	91	100	100	80
20. Maintains/Troubleshoots Equipment	73	92	85	82	85	85	80

Table 3.CC5 (Continued)

BASIC SKILLS							
21. Reading	73	100	93	73	87	87	73
22. Writing	100	87	85	87	80	92	73
23. Arithmetic/Mathematics	80	91	91	87	91	85	80
24. Listening	100	93	93	80	87	80	87
25. Speaking	93	73	80	93	87	80	80
THINKING SKILLS							
26. Creative Thinking	80	87	73	73	93	87	73
27. Decision Making	93	73	73	87	80	100	80
28. Problem Solving	87	73	73	73	87	80	73
29. Seeing Things in the Mind's Eye	80	77	100	100	100	100	80
30. Knowing How to Learn	73	87	87	87	87	80	73
31. Reasoning	87	80	80	80	80	73	80
PERSONAL QUALITIES							
32. Responsibility	100	80	87	87	87	93	87
33. Self-Esteem	100	93	93	87	100	73	93
34. Sociability	100	87	87	87	93	80	73
35. Self-Management	93	80	87	73	93	80	80
36. Integrity/Honesty	100	93	93	87	93	80	93

Note: **Shadow** = no consensus reached

Underline = consensus of one rating at 70% or more.

No underline - consensus of two adjacent ratings at 80% or more.

Table 3.CC6

Postsecondary Employability Skills and Competencies Not Reaching Pre-Established Levels of Consensus[a] (N=11)

EMPLOYABILITY SKILL	COMPETENCY	LEVEL OF CONSENSUS
Manages Time	Human Growth	73%

[a]Consensus=80% agreement for 2 adjacent ratings or 70% of one rating on a scale from 4 (very important) to 1 (not important)

Item mean scores, reported in Table 3.CC7, were examined to determine the perceived importance of SCANS employability skills relative to each of the seven child care competency areas. 234 (93%) of the 251 postsecondary items achieving consensus had means of 2.5 or above, and therefore, were considered important.

Table 3.CC7

IMPORTANCE OF EMPLOYABILITY SKILLS: CHILD CARE/SECONDARY

4=very important; 3=important; 2=somewhat important; 1=not important

COMPETENCY MEAN

EMPLOYABILITY SKILL	TOTAL	Professionalism	Human Growth	Guidance	Family/Community Curriculum	Program Mgt.	Safety/Health	
RESOURCES								
1. Manages Time	3.5	3.8	**2.8**	3.3	3.5	3.5	3.3	3.7
2. Manages Money	2.7	3.3	2.5	2.1	2.8	2.7	2.5	3.3
3. Manages Material & Facilities	3.5	3.8	3.2	3.3	3.6	3.4	3.4	3.6
4. Manages Human Resources	3.5	3.8	3.4	3.3	3.4	3.4	3.3	3.5
RESOURCES TOTAL MEAN	3.3	3.7	3.0	3.0	3.3	3.3	3.2	3.5
INTERPERSONAL SKILLS								
5. Participates as Member of a Team	3.6	**4.0**	3.3	3.6	3.4	3.8	3.5	3.9
6. Teaches Others New Skills	3.5	3.8	3.4	3.4	3.3	3.4	3.3	3.5
7. Serves Clients/Customers	3.4	3.9	3.3	3.3	3.3	3.7	3.0	3.4
8. Exercises Leadership	3.3	3.7	3.0	3.2	3.3	3.2	3.2	3.5
9. Negotiates	3.2	3.7	2.8	3.2	3.1	3.4	2.7	3.4
10. Works with Diversity	3.5	3.7	3.5	3.4	3.7	3.7	3.0	3.6
INTERPERSONAL TOTAL MEAN	3.4	3.8	3.2	3.4	3.4	3.5	3.2	3.6
INFORMATION								
11. Acquires & Evaluates Information	3.5	3.7	3.5	3.4	3.6	3.5	3.4	3.6
12. Organizes & Maintains Information	3.4	3.7	3.2	3.3	3.5	3.3	3.5	3.5
13. Interprets/Communicates Information	3.7	3.9	3.7	3.7	3.6	3.7	3.6	3.7
14. Uses Computers to Process Information	2.2	2.7	1.7	1.5	2.5	2.1	1.7	3.1
INFORMATION TOTAL MEAN	3.2	3.5	3.1	3.0	3.3	3.2	3.1	3.5
SYSTEMS								
15. Understands Systems	3.2	3.2	3.3	3.3	3.1	3.3	2.6	3.6
16. Monitors & Corrects Performance	3.4	3.5	3.2	3.4	3.3	3.2	3.4	3.5
17. Improves or Designs Systems	3.0	3.3	2.7	2.8	3.0	2.8	3.2	3.3
SYSTEMS TOTAL MEAN	3.2	3.3	3.1	3.2	3.1	3.1	3.1	3.5

Table 3.CC7 (Continued)

TECHNOLOGY								
18. Selects Technology	2.4	2.2	2.1	2.2	2.6	2.4	2.3	3.1
19. Applies Technology to Task	2.6	2.6	2.1	2.2	2.8	2.6	2.6	3.0
20. Maintains & Troubleshoots Equipment	2.3	2.2	1.7	2.0	2.1	2.2	2.5	3.1
TECHNOLOGY TOTAL MEAN	2.4	2.3	2.0	2.1	2.5	2.4	2.5	3.1
BASIC SKILLS								
21. Reading	3.6	3.7	3.7	3.5	3.7	3.5	3.5	3.5
22. Writing	3.4	3.7	3.4	3.2	3.5	3.4	3.2	3.5
23. Arithmetic/Mathematics	3.2	3.3	3.2	3.1	3.4	3.2	2.8	3.2
24. Listening	3.8	**4.0**	3.8	3.9	3.8	3.9	3.7	3.7
25. Speaking	3.7	3.9	3.7	3.7	3.5	3.9	3.4	3.6
BASIC SKILLS TOTAL MEAN	3.5	3.7	3.6	3.5	3.6	3.6	3.3	3.5
THINKING SKILLS								
26. Creative Thinking	3.6	3.7	3.4	3.7	3.7	3.6	3.5	3.5
27. Decision Making	3.6	3.9	3.6	3.6	3.5	3.6	3.7	3.6
28. Problem Solving	3.7	3.9	3.7	3.7	3.6	3.8	3.7	3.5
29. Seeing Things in the Mind's Eye	3.4	3.5	3.2	3.3	3.3	3.3	3.3	3.6
30. Knowing How to Learn	3.6	3.7	3.9	3.8	3.8	3.3	3.3	3.6
31. Reasoning	3.7	3.9	3.8	3.7	3.7	3.8	3.6	3.7
THINKING SKILLS TOTAL MEAN	3.6	3.8	3.6	3.6	3.6	3.6	3.5	3.6
PERSONAL QUALITIES								
32. Responsibility	3.9	**4.0**	3.8	3.9	3.9	3.9	3.9	3.7
33. Self-Esteem	3.9	**4.0**	3.9	3.9	3.9	**4.0**	3.6	3.8
34. Sociability	3.6	**4.0**	3.4	3.9	3.5	3.9	3.2	3.6
35. Self-Management	3.7	3.9	3.8	3.9	3.7	3.5	3.7	3.7
36. Integrity/Honesty	3.9	**4.0**	3.9	3.9	3.8	3.9	3.8	3.9
PERSONAL QUALITIES TOTAL MEAN	3.8	4.0	3.8	3.9	3.8	3.8	3.6	3.7

>Mean underlined indicates skills considered not important, less than 2.5.

>Mean shadowed indicates no consensus reached.

>Consensus defined as 70% for 1 score or 80% for 2 adjacent scores.

>**Bold**=4.0 (very important)

Results indicated that when examined by SCANS categories, the Personal Qualities category was perceived as most important with a mean of 3.8. Means for the other categories were: Thinking Skills (3.6), Basic Skills (3.5), Interpersonal Skills (3.4), Resources (3.3), Information and Systems (3.2), and Technology (2.4).

In three categories, Basic Skills, Thinking Skills, and Personal Qualities, all items in each category reached consensus and had mean scores of 3.0 or above suggesting that respondents perceived each skill to be either "important" or "very important." The percentages of items reaching consensus with means of 2.5 or above in the other SCANS categories were as follows: Systems (100%), Interpersonal (100%), Resources (96%), Information (86%), and Technology (43%).

The most important employability skills as shown by total item means (across seven competency areas) were Responsibility, Self-Esteem, and Integrity/Honesty (X = 3.9). The least important skill was Uses Computers to Process Information (X = 2.2). Seven individual SCAN skills had item means of 4.0. Six of the seven were in the competency area of Professionalism. They were Participates as Member of a Team, Listening, Responsibility, Self-Esteem, Sociability, and Integrity/Honesty. The seventh skill was Self-Esteem in the Family/Community competency area. The least important individual SCAN skill was Uses Computers to Process Information as indicated by item mean score of 1.5 in the Guidance area. See Table 3.CC7.

When examined by competency areas, there was some variation in the perceived importance of SCANS employability skills. This was particularly true for Technology, with means ranging from 2.0 to 3.1, and Information, with means from 3.0 to 3.5. For each of the other categories the range of means was .5 or less. See Table 3.CC8.

Table 3.CC8

Mean Summary of Employability Skills: Child Care/PostSecondary

4=very important; 3=important; 2=somewhat important; 1=not important

EMPLOYABILITY SKILL	COMPETENCY MEAN							
		Professionalism		Guidance		Family/Community	Program Mgt.	
	TOTAL		Human Growth		Curriculum		Safety/Health	
RESOURCES	3.3	3.7	3.0	3.0	3.3	3.3	3.2	3.5
INTERPERSONAL SKILLS	3.4	3.8	3.2	3.4	3.4	3.5	3.2	3.6
INFORMATION	3.2	3.5	3.1	3.0	3.3	3.2	3.1	3.5
SYSTEMS	3.2	3.3	3.1	3.2	3.1	3.1	3.1	3.5
TECHNOLOGY	2.4	2.3	2.0	2.1	2.5	2.4	2.5	3.1
BASIC SKILLS	3.5	3.7	3.6	3.5	3.6	3.6	3.3	3.5
THINKING SKILLS	3.6	3.8	3.6	3.6	3.6	3.6	3.5	3.6
PERSONAL QUALITIES	3.8	4.0	3.8	3.9	3.8	3.8	3.6	3.7
GRAND MEAN	3.3	3.5	3.2	3.2	3.3	3.3	3.2	3.5

Summary of Findings

Horticulture

The return rate for the first and second round of the floriculture survey was 91.6% and 63.6%, respectively. Forty-seven occupation specific competencies were validated as being important for entry-level positions in the floriculture industry. Only one SCANS skill, "Processes information with computers," was thought of as being not important by respondents of the floriculture survey.

The nursery and greenhouse survey had an 85.7% response rate for the first round and a 90.0% response rate for the second round of the survey.

Twenty occupation-specific competencies were validated as being important for entry-level positions in the nursery and greenhouse industry. Twenty-three SCANS skills were validated as being important for entry-level positions in the nursery and greenhouse industry. Ten SCANS skills were determined as being not important.

The first and second round of the landscaping survey received 71.4% and 83.3% response rate, respectively. Forty-one landscaping competencies were validated as being important for entry-level positions in the landscaping industry. All but one general employability skill, "Processes information with computers," was validated as being important for entry-level landscaping occupations.

Child Care

The findings of the Delphi survey related to the integration of SCANS employability skills within child care occupations are summarized as follows:

(1) For students exiting secondary programs, there was agreement as to the importance of 99.6% of the SCANS items. One of the 252 items failed to reach consensus.

(2) Of the secondary items reaching consensus, 94% were considered important/very important.

(3) For secondary programs, SCAN skills in the categories of Personal Qualities and Basic Skills were perceived as most important. Skills in the Technology category were viewed as least important.

(4) At the secondary level, Listening and Responsibility were rated as the most important SCAN skills across the seven child care competency areas. Using Computers to Process Information was rated least important.

(5) For students exiting postsecondary programs, there was agreement as to the importance of 99.6% of the SCANS items. One of the 252 items failed to reach consensus.

(6) Of the postsecondary items reaching consensus, 93% were considered important/very important.

(7) For postsecondary programs, SCAN skills in the category of Personal Qualities were perceived as most important. Skills in the Technology category were viewed as least important.

(8) At the postsecondary level, Responsibility, Self-Esteem, and Integrity/Honesty were rated as the most important SCAN skills across the seven child care competency areas. Using Computers was rated least important.

(9) Agreement as to importance was reached on the same number of SCANS employability skills (251 of 252) for students exiting secondary and postsecondary programs. However, the level of agreement (100% on 27 items) tended to be higher relative to students exiting postsecondary programs. At the secondary level, there was 100% agreement on only seven employability skills.

(10) In general, item mean scores were somewhat higher at the postsecondary level, suggesting that SCAN skills were considered more important for jobs requiring advanced preparation.

(11) The order of importance of SCAN skills was similar for secondary and postsecondary programs. Personal Qualities, Basic Skills, and Thinking Skills ranked at the top, and Technology, at the bottom.

(12) Overall, SCAN skills were perceived as equally important across the seven child care competency areas at the secondary level. The same was true at the postsecondary level, except for Technology and Information skills which were viewed as somewhat more important for some competency areas than others.

Conclusions and Implications

Horticulture

This project has far-reaching implications in many areas of agricultural education. The final validated competency list will be used to revise and update the current horticulture curriculum in Texas public secondary schools. By using the input of business and industry leaders, the Texas education system should be able to produce students that are better prepared to meet the challenges and requirements of today's competitive job market. Recommendations will be made for further research concerning the importance and impact of business and industry validated competencies in many other areas of agriculture.

Child Care

The project sought to identify and validate outcomes and procedures for measuring occupational competencies including students' ability to demonstrate application of SCANS within Child Care occupations. The findings of the study point to a number of implications for instruction, curriculum development, and authentic assessment.

The use of the Delphi method proved to be appropriate for this study since consensus was reached on a large majority of the competencies. For students exiting secondary and postsecondary programs, there was agreement as to the importance of 99.6% of the SCANS items.

Because of the complexity of the instrument used for data collection (eight SCAN skills across seven child care competency areas), the response rate was low for the first round of the Delphi (37% for secondary, 31% for postsecondary). For the second round, the response rate improved to 72% and 87% respectively. Third round response rates were 100% for secondary respondents and 85% for postsecondary respondents. This follows the pattern of other studies using the Delphi technique, that is, as the study progresses, the rate of attrition decreases. Although a better response rate would have been preferable, the final sample size of thirteen and eleven is near the lower range of 12 to 15 recommended for the Delphi method. One strength of the Delphi method is the opportunity for a relatively small panel of experts to respond repeatedly until consensus is achieved.

Although there were some differences in the order of importance, Personal Qualities, Basic Skills, Thinking Skills, Interpersonal Skills, Resources, and Systems were considered important in Child Care occupations at both the secondary and postsecondary levels. Information and Technology skills were rated as less important.

Instruction and authentic assessment in Child Care occupations should focus on SCAN skills as they relate to occupation specific competencies. The competencies that were considered the most important in this study might receive greater emphasis. These would include: Personal Qualities, Basic Skills, Interpersonal Skills, Thinking Skills, Systems, Resources and Information.

The SCANS Foundation Skills of Basic Skills, Thinking Skills and Personal Qualities ranked at or near the top in order of importance at both secondary and postsecondary levels. This implies that for both entry level and advanced positions in Child Care, employers expect that workers will possess

these "workplace basics." Well developed skills in oral and written communication, decision making and problem solving, and self-esteem and integrity apparently are perceived as fundamental pre-requisites for success in the workplace.

SCAN skills related to Technology and the Information skill, "Uses Computers to Process Information," also are important for inclusion in instruction and assessment for both secondary and postsecondary programs. Although considered less important by respondents in this study, the increasing use of all types of technology, including computers, in the workplace makes these skills essential for success. Respondents may have rated these skills lower because of ambiguity of wording, because they had too narrow a view of technology, or perhaps they lacked the skills themselves. It also is important to note that the SCAN skills related to Technology are rather generic and do not address the specific use of technology in Child Care instruction.

According to the respondents in this study, the SCAN skills should be integrated across all occupational specific child care competencies at the secondary level: Professionalism, Human Growth, Guidance, Curriculum, Family/Community, Safety/Health, and Program Management. At the postsecondary level, integration of SCANS may be more appropriate for some competency areas than others.

Although the same number of items reached consensus at the secondary and postsecondary level, more were considered to be important at the postsecondary level, as evidenced by higher mean scores. In addition, the level of agreement was higher for the postsecondary program as reflected by 100% agreement for twenty-seven items as opposed to only seven items at the secondary level. Postsecondary programs may be perceived as having a curriculum more focused on skills needed by today's employees in quality Child Care facilities. In addition, students pursuing postsecondary education may be more career oriented, whereas secondary programs may be serving a more diverse student population, that is, not all secondary students are serious about pursuing a child care occupation.

CHAPTER IV
AUTHENTIC ASSESSMENT
Definition

Authentic assessment is a form of evaluation that requires students to demonstrate proficiency in a variety of ways rather than select an answer from a ready-made list. For example, a student may be asked to perform a skill, solve a problem, or generate scientific hypotheses. The quality of the student's work is judged based on an established set of criteria. Other terms used for authentic assessment in the literature include alternative, direct, or performance assessment.

Authentic Assessment in Educational Programs

A review of the literature and a series of telephone interviews revealed that authentic assessment is being used in a variety of educational programs across the United Sates. States incorporating this type of assessment into educational programs include: Alabama, Alaska, California, Colorado, Connecticut, Kentucky, Louisiana, New Mexico, Oregon, Pennsylvania, Vermont, and Wisconsin, among others.

Examples of Authentic Assessment

Portfolios appear to be the major form of authentic assessment currently being used. Portfolios are used in a number of areas including writing, mathematics, fine arts, social studies, languages, reading, science, vocational education, employability skills, and interpersonal skills.

Portfolios may be single occasion assessments or samples over time; single attribute or multi-dimensional assessment; individually prepared or group "products." Although useful for formative assessment, the preferred use of portfolios is in summative evaluation of students' exit level competencies.

Components of a portfolio might include: essays, book reports, research papers, autobiographies, letters of recommendations, resumes, certificates of mastery, photographs and sketches/illustrations of products and projects, and plans (Abruscato, 1993; Camp & Levine, 1991; Forseth, 1992; Kreckevsky, 1991; McRobbie, 1992; Weinbaum, 1991).

Direct assessment of performance is a second form of authentic assessment currently in use. Performance assessment is used in science, mathematics, business and office education, foreign languages, and a variety of other subjects. Writing is the most common skill tested by performance assessment. The writing portion of the Texas Assessment of Academic Skills (TAAS) is an example of this type of authentic assessment. Other examples include open-

ended test items, research papers, job applications and resumes, journals, and reflective writing.

Employability skills, both generic and occupation specific, often are evaluated by direct performance assessment. Scoresheets and observation checklists are used to indicate student achievement of performance standards. A certificate of mastery or other evidence of performance assessment may be included in a portfolio (Hanson, 1992; LeMahieu, Eresh, & Wallace, 1992; McDonald, 1993; Redding, 1992; Shepard, 1989; Stefonek, 1991; Valencia, Pearson, Peters, and Wixson, 1989; Wiggins, 1989).

The student project, one of the most versatile forms of authentic assessment, can be used in virtually any subject area. Projects may be cone individually or by a group of students. Students may be required to give a demonstration, prepare an exhibition, participate in a live performance, or produce a product. Projects usually include oral presentations which may be done in class or in front of another audience (McDonald, 1993).

Other forms of authentic assessment include reflective interviews, experimental inquiries, and simulations (including computer simulations) (Baron, 1989; Shavelson & Baxter, 1992; Wolf, 1987-1988).

Characteristics of Authentic Assessment

In all forms of authentic assessment, evaluation should reflect self-assessment as well as evaluation by raters or judges. These judges may include the classroom teacher and other school personnel as well as external reviewers such as business and industry representatives. Evaluation of the students' work should be based on agreed-upon criteria.

Several characteristics appear to be common for all forms of authentic assessment and across subject areas. Authentic assessment:

* tailors assessment to the curriculum that is taught;
* places emphasis on the importance of the task to be assessed rather than on ease of measurement;
* provides alternatives to traditional pencil and paper tests;
* requires students to perform a task rather than select an answer from a list;
* examines student performance of significant tasks, relevant to real life;
* emphasizes higher order thinking skills, problem solving, and decision making;
* promotes student self-evaluation and reflection;
* provides evidence of organizational skills.

Advisory Committee Recommendations

An Advisory Committee meeting was held in Austin, Texas on April 26, 1994. The committee was comprised of business and industry representatives (horticulture and child care occupations), educators, and personnel from the Texas Education Agency. The purpose of the meeting was to identify authentic assessment procedures for use with career and technology students in Texas. The major recommendation was that career portfolios and direct performance assessment be pursued as primary authentic assessment techniques for use in career and technology education programs.

The Advisory Committee further recommended that business and industry representatives be involved in determining the criteria for career portfolios. According to the advisory committee, portfolios would best serve business and industry if they contain evidence of students' ability to perform in an occupational setting. It was determined by the advisory committee that business and industry can be of assistance in developing model portfolios.

Direct assessment of performance also needs input from business and industry. The advisory committee suggested that ways to involve business and industry in performance events be explored. Performance events could lead to some form of certification which could serve as documentation of the students ability to perform specific occupationally related skills and abilities. Performance events could be held locally to assure access to all students.

Additionally, the advisory committee recommended that authentic assessment procedures be field tested prior to statewide implementation. Inservice efforts should precede implementation.

As a result of Advisory Committee input, the project staff recommends that authentic assessment in Texas should include a variety of methods (such as direct performance assessment, student projects, and oral examinations) to culminate in a career portfolio which will demonstrate to potential employers the student's entry level competencies.

Future Implementation Strategies for Authentic Assessment

Having accomplished the objectives of the current project, the project staff recommends the following "next steps" which are necessary to achieve the goal of implementing a statewide plan of authentic assessment.

<u>Steps for 1994-1995</u>

1. Validate criteria for the development of a career portfolio to focus on SCAN skills within specific occupations. This could be done through focus groups or individual interviews with business and industry representatives from Horticulture and Child Care occupational areas to identify the information that would be most useful to potential employers

of career and technology education students by establishing the criteria using core standards and measures of performance.

2. Identify ways to integrate authentic assessment in career and technology education with authentic assessment in general education. This should be done in consultation with representatives of general education to determine how evidence of student's accomplishment/work, across the curriculum and over time, could be included in a single career portfolio.

3. Establish criteria for authentic assessment tools to be used in the development of a career portfolio, to include, but not be limited to, direct performance assessment, student projects, and oral examinations.

4. Develop a model of a career portfolio that could be adapted for use in all occupational areas and with all types of students--limited English, disabled, gifted and talented.

Steps for 1995-1996

1. Conduct field tests of authentic assessment tools in selected occupational programs.

2. Develop multiple methods for providing technical assistance (including staff development) for implementation of authentic assessment at the local level.

3. Refine the results of the two years of study in order to prepare for inservice training of teachers.

4. Provide inservice for teachers prior to statewide implementation of authentic assessment.

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APPENDIX A

Authentic Assessment Advisory Committee Agenda & Correspondence

Authentic Assessment Advisory Committee Meeting Tentative Agenda

Introductions - 10:00 A.M.

Overview - 10:15 A.M.

- *Results of competency study*
- *Background of SCANS*
- *Purpose of Authentic Assessment*
- *Committee Charge*

Individual Committee Work - 11:15 A. M.

- *Share Authentic Assessment ideas within group*
- *Correlate authentic assessment techniques with specific competencies*
- *Choose ideas to share in general committee meeting*

Lunch Break - 12:30

General Committee Meeting - 1:00 P.M.

- *Share ideas concerning assessment techniques from individual meeting*
- *If necessary, view authentic assessment video to generate ideas about authentic assessment techniques*

Individual Committee Work - 2:00 P.M.

- *Determine which competencies and scans are being assessed by the different techniques*
- *Finalize priority listing of authentic assessment techniques*

General Committee Meeting - 3:00

- *Integration of the best authentic assessment techniques across occupations*
- *Recommendations from advisory committee for further study*
- *Travel Vouchers*
- *Closing Remarks*

Adjourn Meeting - 4:00

TEXAS TECH
UNIVERSITY

Department of Agricultural Education
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memo:

TO: Members of the Advisory Committee on Authentic Assessment for Career and Technology Education

FROM: David E. Lawver
Gin Felstehausen
Project Co-directors

SUBJECT: Advisory Committee Meeting, 10:00 a.m., Tuesday, April 26, 1994

DATE: Monday, April 13, 1994

Thank you so much for agreeing to provide guidance to our efforts. Simply put, we are seeking to design a new way to assess the achievement of those who receive an education in Texas Public Schools. We hope that our efforts result in a model for assessment that will truly reflect the skills and abilities of youngsters who are educated in the state of Texas. It is also our desire that employers in the State benefit from this effort as well. We envision that students who are assessed in this manner will have "Authentic" evidence of their achievement as they enter the work force. Employers should have better information as they make hiring decisions.

This committee is made up of people from a wide variety of backgrounds. First of all, we have individuals whose interests are primarily in child care and individuals whose interests are in horticulture. These career areas represent the expertise of the Project Staff at Texas Tech University. Also, we have individuals who represent business and industry. As efforts are made to increase the employability of Texas young people, who should be better able to help guide our efforts? Finally, we have individuals from various levels of education. Public school teachers and administrators, people from higher education, and representatives from the Texas Education Agency will participate in this meeting.

Resources for the work of this committee are limited. This is why we plan to meet for only six hours on Tuesday, April 26th, 1994. Given this relatively short meeting, the project staff feels that some preliminary work by members of the committee will help immensely. Therefore, we are providing some supplementary materials so that you will be oriented to the task at hand. Enclosed you should find: 1) validated competency lists for child care and horticulture; 2) two short articles on authentic assessment/performance assessment; 3) a meeting agenda; 4) a listing of committee members; and 5) a worksheet for your use in preparing for this meeting.

An EEO/Affirmative Action Institution

To insure a productive and efficient meeting, we are asking each of the members to review the enclosed materials. The worksheet will serve to guide your preparation. Completing the worksheet will stimulate your thoughts concerning authentic assessment. As part of the worksheet exercise, you are asked to think about the various skills and abilities that are associated with child care and horticulture and the types of evidence that could be used to demonstrate the student's proficiency in those skills and abilities. You will be called upon to present ideas you may have about the types of evidence that could be used in authentic assessment. As a guideline, we are asking each committee member to be prepared to present at least two ideas about what can serve as authentic assessment in child care and/or horticulture.

Once again, the project staff is genuinely appreciative of your willingness to participate in this project. The meeting will be held on Tuesday, April 26th, 1994 in Austin at the Texas Education Agencies offices in the Hartland Plaza Building at 1717 West 6th Street in rooms 335 and 355. Our agenda calls for the meeting to begin at 10:00 a.m. We plan to be finished by shortly after 4:00 p.m. Should you have questions or concerns, please call David Lawver or Sarah Jones at (806) 742-2816 or Ginny Felstehausen or Susan Bolen at (806) 742-3068.

Parking:
We have been instructed that the parking lot directly behind the Hartland Plaza Building is reserved. To avoid being towed, you should park across the street (5th street). Be sure to use the pedestrian overpass to cross the street as traffic is often quite heavy.

APPENDIX B.1

Floriculture Survey First Round

ENTRY-LEVEL COMPETENCIES IN FLORICULTURE OCCUPATIONS

DEMOGRAPHICS

1. Type of business _____
2. Name and address of business _____
   _____
3. Number of employees _____
4. Years of experience in horticulture _____
5. Position title _____

RATING: Please rate the following competencies to indicate their importance in full-time entry-level positions needed in your business.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

FLORICULTURE COMPETENCIES	V	I	S	N
1. Comprehends basic plant science				
1.1 Understands plant propagation	4	3	2	1
1.2 Prepares soil and media mixes	4	3	2	1
1.3 Identifies plants by common and scientific name	4	3	2	1
1.4 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
2. Controls the plant environment				
2.1 Fertilizes plants as needed	4	3	2	1
2.2 Utilizes appropriate watering techniques	4	3	2	1
2.3 Control diseases and/or pests	4	3	2	1
2.4 Removes diseased and/or damaged plants	4	3	2	1
2.5 Maintains storage temperature for flowers	4	3	2	1
2.6 Maintains clean and sanitized facilities	4	3	2	1
2.7 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1

RATING: **Please rate the following competencies to indicate their importance in full-time entry-level positions needed in your business.**

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

FLORICULTURE COMPETENCIES	V	I	S	N
3. Develops skills in merchandise handling				
3.1 Verify received merchandise	4	3	2	1
3.2 Maintains current inventory	4	3	2	1
3.3 Prepares cut flowers for display and purchase	4	3	2	1
3.4 Prepares plants for display and purchase	4	3	2	1
3.5 Delivers products to customers efficiently	4	3	2	1
3.6 Arranges displays with maximum effect	4	3	2	1
3.7 Performs routine maintenance when needed	4	3	2	1
3.8 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
4. Plans floral designs and arrangements				
4.1 Lists and explains the basic rules of flower arrangement	4	3	2	1
4.2 Selects and constructs examples of floral design forms	4	3	2	1
4.3 Explains rules of color use in floral design	4	3	2	1
4.4 Identifies appropriate flowers to be used in an arrangement	4	3	2	1
4.5 Identifies appropriate tools and accessories to be used	4	3	2	1
4.6 Prepares flowers needed for an arrangement	4	3	2	1
4.7 Prepares additional materials needed for an arrangement	4	3	2	1
4.8 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
5. Designs various floral arrangements				
5.1 Produces a fresh flower arrangement	4	3	2	1
5.2 Produces a silk flower arrangement	4	3	2	1
5.3 Produces a dry flower arrangement	4	3	2	1
5.4 Makes various types of boutonnieres	4	3	2	1
5.5 Makes various types of corsages	4	3	2	1
5.6 Constructs appropriate funeral arrangements	4	3	2	1
5.7 Constructs wedding nosegays	4	3	2	1
5.8 Constructs wedding arrangements	4	3	2	1
5.9 Designs arrangements for holidays	4	3	2	1
5.10 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1

RATING: Please rate the following competencies to indicate their importance in full-time entry-level positions needed in your business.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

FLORICULTURE COMPETENCIES	V	I	S	N
6. Maintains interior landscapes				
6.1 Identifies interior plants by common and botanical names	4	3	2	1
6.2 Locates interior plants according to light requirements	4	3	2	1
6.3 Cleans and maintains plants for optimum growth	4	3	2	1
6.4 Diagnoses and controls plant pest problems	4	3	2	1
6.5 Waters and fertilizes interior plants for optimum growth	4	3	2	1
6.6 Trims interior plants for improved growth and appearance	4	3	2	1
6.7 Markets plants for optimum return	4	3	2	1
6.8 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
7. Develops skills in marketing and sales				
7.1 Prepares plants and merchandise for marketing	4	3	2	1
7.2 Prepares plants and merchandise for display	4	3	2	1
7.3 Displays plants and merchandise effectively	4	3	2	1
7.4 Assists customers with plant selection	4	3	2	1
7.5 Takes orders by phone and fax	4	3	2	1
7.6 Writes up customer orders	4	3	2	1
7.7 Conducts sales transactions	4	3	2	1
7.8 Sends and receives wire orders	4	3	2	1
7.9 Prepares advertisements	4	3	2	1
7.10 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1

When rating the following general employability skills, please consider them in the context of the occupation specific competencies which you just completed. For example, under "Manages resources wisely" consider "Supply and equipment management " (IC) as it relates to "Prepares media mixes" (3.6) in the occupational competencies.

RATING: Please rate all of the following competencies to indicate their importance in full-time entry-level positions.

4- Very important (V)
3- Important (I)
2- Somewhat important (S)
1- Not important (N)

EMPLOYABILITY SKILLS	V	I	S	N
I. Manages resources wisely				
A. Time management	4	3	2	1
B. Money management	4	3	2	1
C. Supply and equipment management	4	3	2	1
D. Personnel management	4	3	2	1
II. Exhibits strong interpersonal skills				
A. Works as a team member	4	3	2	1
B. Helps to teach others	4	3	2	1
C. Assists clients/customers	4	3	2	1
D. Shows leadership	4	3	2	1
E. Mediates decision making	4	3	2	1
F. Interacts well with other cultures	4	3	2	1
III. Uses information appropriately				
A. Collects pertinent information	4	3	2	1
B. Interprets information	4	3	2	1
C. Disseminates information	4	3	2	1
D. Processes information with computers	4	3	2	1
IV. Understands complex relationships				
A. Monitors and corrects performance	4	3	2	1
B. Improves and/or designs systems	4	3	2	1
V. Uses technology appropriately				
A. Interprets technology	4	3	2	1
B. Applies technology	4	3	2	1
C. Evaluates technology	4	3	2	1

RATING: Please rate all of the following competencies to indicate their importance in full-time entry-level positions.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

EMPLOYABILITY SKILLS	V	I	S	N
VI. Possesses critical skills				
A. Reading	4	3	2	1
B. Writing	4	3	2	1
C. Mathematics	4	3	2	1
D. Listening	4	3	2	1
E. Speaking	4	3	2	1
VII. Possesses thinking skills				
A. Creative thinking	4	3	2	1
B. Decision making	4	3	2	1
C. Problem solving	4	3	2	1
D. Adapting to change	4	3	2	1
E. Reasoning	4	3	2	1
VIII. Possesses personal skills				
A. Responsibility	4	3	2	1
B. Self-Esteem	4	3	2	1
C. Self-Motivation	4	3	2	1
D. Social correctness	4	3	2	1
E. Honesty	4	3	2	1

APPENDIX B.2
Floriculture Survey Second Round

ENTRY-LEVEL COMPETENCIES IN FLORICULTURE OCCUPATIONS 2ND ROUND DELPHI SURVEY

INSTRUCTIONS: The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business.

4- Very important (V)
3- Important (I)
2- Somewhat important (S)
1- Not important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

FLORICULTURE COMPETENCIES	Your 1st response	1st round average	Please mark your 2nd response V	I	S	N
1. Comprehends basic plant science 1.3 Identify plant by common & scientific name Explanation: (If 2nd round answer is different from 1st round average) _____ *Agreement - Not important as a competency* *1.1 Understands plant propagation* *1.2 Prepares soil and media mixes*		**3**	4	3	2	1
2. Controls the plant environment 2.1 Fertilizes plants as needed Explanation: _____ *Agreement - Important as a competency* *2.2 Utilizes appropriate watering techniques* *2.3 Control diseases and/or pests* *2.4 Removes diseased and/or damaged plants* *2.5 Maintains storage temperature for flowers* *2.6 Maintains clean and sanitized facilities*		**3**	4	3	2	1
3. Develops skills in merchandise handling 3.2 Maintains current inventory Explanation: _____ *Agreement - Important as a competency* *3.1 Verify received merchandise* *3.3 Prepares cut flowers for display & purchase* *3.4 Prepares plants for display & purchase* *3.5 Delivers products to customers efficiently* *3.6 Arranges displays with maximum effect* *3.7 Performs routine maintenance when needed*		**3**	4	3	2	1

BEST COPY AVAILABLE

*INSTRUCTIONS: The average response from the first round has been rounded off to the nearest whole number and is indicated in **bold** in the second column. Your individual first round response is underlined and indicated in the first column. **Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business.***

4- Very important (V)
3- Important (I)
2- Somewhat important (S)
1- Not important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

FLORICULTURE COMPETENCIES	Your 1st response	1st round average	Please mark your 2nd response V	I	S	N
4. Plans floral designs and arrangements *Agreement - Important as a competency* *4.1 Lists and explains the basic rules of flower arrangement* *4.2 Selects and constructs examples of floral design forms* *4.3 Explains rules of color use in floral design* *4.4 Identifies appropriate flowers to be used in an arrangement* *4.5 Identifies appropriate tools and accessories to be used* *4.6 Prepares flowers needed for an arrangement* *4.7 Prepares additional materials needed for an arrangement*						
5. Designs various floral arrangements 5.2 Produces a silk flower arrangement 5.3 Produces a dry flower arrangement 5.4 Makes various types of boutonnieres 5.5 Makes various types of corsages 5.7 Constructs wedding nosegays 5.8 Constructs wedding arrangements Explanation:_____ _____ _____ _____ _____ _____ *Agreement - Important as a competency* *5.1 Produces a fresh flower arrangement* *5.6 Construct appropriates funeral arrangements* *5.9 Designs arrangements for holidays*		3 3 3 3 3 3	4 4 4 4 4 4	3 3 3 3 3 3	2 2 2 2 2 2	1 1 1 1 1 1

BEST COPY AVAILABLE

INSTRUCTIONS: The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

FLORICULTURE COMPETENCIES	Your 1st response	1st round average	Please mark your 2nd response V	I	S	N
6. Maintains interior landscapes 6.4 Diagnoses and controls plant pest problems Explanation:_____ _____ _____ _____ *Agreements- Important as a competency* *6.1 Identifies interior plants by common and botanical names* *6.2 Locates interior plants according to light requirements* *6.3 Cleans and maintains plants for optimum growth* *6.5 Waters and fertilizes interior plants for optimum growth* *6.6 Trims interior plants for improved growth and appearance* *6.7 Markets plants for optimum return*		**3**	4	3	2	1
7. Develops skills in marketing and sales *Agreement - Important as a competency* *7.1 Prepares plants and merchandise for marketing* *7.2 Prepares plants and merchandise for display* *7.3 Displays plants and merchandise effectively* *7.4 Assists customers with plant selection* *7.5 Takes orders by phone and fax* *7.6 Writes up customer orders* *7.7 Conducts sales transactions* *7.8 Sends and receives wire orders* *Agreement - Not important as a competency* *7.9 Prepares advertisements*						

INSTRUCTIONS: *The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column.* ***Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business.***

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

EMPLOYABILITY SKILLS-FLORICULTURE	Your 1st response	1st round average	Please mark your 2nd response V	I	S	N
I. Manages resources wisely D. Personnel management Explain: (if 2nd round answer is different from 1st round average)_____ *Agreement - Important as a competency* *A. Time management* *B. Money management* *C. Supply and equipment management*		**3**	4	3	2	1
II. Exhibits strong interpersonal skills E. Mediates decision making Explanation:_____ *Agreement - Important as a competency* *A. Works as a team member* *B. Helps to teach others* *C. Assists clients/customers* *D. Shows leadership* *F. Interacts well with other cultures*		**3**	4	3	2	1
III. Uses information appropriately D. Processes information with computers Explanation: _____ *Agreement - Important as a competency* *A. Collects pertinent information* *B. Interprets information* *C. Disseminates information*		**2**	4	3	2	1
IV. Understands complex relationships B. Improves and/or designs systems Explanation: _____ *Agreement - Important as a competency* *A. Monitors and corrects performance*		**3**	4	3	2	1

INSTRUCTIONS: The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

EMPLOYABILITY SKILLS-FLORICULTURE	Your 1st response	1st round average	Please mark your 2nd response V	I	S	N
V. Uses technology appropriately						
A. Intreprets technology		3	4	3	2	1
B. Applies technology		3	4	3	2	1
C. Evaluates technology		3	4	3	2	1
Explanation:_____						
VI. Possesses critical skills						
Agreement - Important as a competency						
A. Reading						
B. Writing						
C. Mathematics						
D. Listening						
VII. Possesses thinking skills						
Agreement - Important as a competency						
A. Creative thinking						
B. Decision making						
C. Problem solving						
D. Adapting to change						
E. Reasoning						
VIII. Possesses personal skills						
Agreement - Important as a competency						
A. Responsibility						
B. Self-Esteem						
C. Self-Motivation						
D. Social correctness						
E. Honesty						

APPENDIX C.1

Landscaping Survey First Round

RATING: **Please rate the following competencies to indicate their importance in full-time entry-level positions needed in your business.**

4- Very Important
3- Important
2- Somewhat Important
1- Not Important

LANDSCAPING COMPETENCIES	V	I	S	N
3. Installs Landscapes (Excluding Irrigation)				
3.1 Receives and delivers landscape products	4	3	2	1
3.2 Test soil, water, and plant tissues	4	3	2	1
3.3 Propagates plants	4	3	2	1
3.4 Harvest, transport, and install plant material	4	3	2	1
3.5 Prepares the location that is to be landscaped	4	3	2	1
3.6 Prepares media mixes	4	3	2	1
3.7 Demonstrates the correct way to plant shrubs, trees, vines, ground covers, and herbaceous plants	4	3	2	1
3.8 Cleans up the job	4	3	2	1
3.9 Develops bid for a landscape installation job	4	3	2	1
3.10 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
4. Maintains Exterior Landscapes (Excluding turf)				
4.1 Applies appropriate fertilizers	4	3	2	1
4.2 Plans and controls for diseases	4	3	2	1
4.3 Plans and controls for weeds	4	3	2	1
4.4 Plans and controls for pests	4	3	2	1
4.5 Repairs equipment	4	3	2	1
4.6 Maintains upkeep of lawn	4	3	2	1
4.7 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
5. Installs Residential and Commercial Turf Areas	4	3	2	1
5.1 Identifies turf species commonly used in the local area	4	3	2	1
5.2 Identifies characteristics of turf species	4	3	2	1
5.3 Selects appropriate turf species	4	3	2	1
5.4 Prepares soil for installing turf	4	3	2	1
5.5 Installs turf using sod, stolons, plugs, or seed	4	3	2	1
5.6 Irrigates newly installed turf for optimum growth	4	3	2	1
5.7 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1

RATING: Please rate the following competencies to indicate their importance in full-time entry-level positions needed in your business.

4- Very Important
3- Important
2- Somewhat Important
1- Not Important

LANDSCAPE COMPETENCIES	V	I	S	N
6. Maintains Residential and Commercial Turf Areas	4	3	2	1
6.1 Applies appropriate fertilizers	4	3	2	1
6.2 Plans and controls for diseases	4	3	2	1
6.3 Plans and controls for weeds	4	3	2	1
6.4 Plans and controls for pests	4	3	2	1
6.5 Repairs equipment	4	3	2	1
6.6 Maintains upkeep of lawn	4	3	2	1
6.7 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
7. Landscape Business Management	4	3	2	1
7.1 Understands lanscaping and turf industries	4	3	2	1
7.2 Prepares estimates and establishes contracts	4	3	2	1
7.3 Designs and sells landscape projects	4	3	2	1
7.4 Uses and maintains price lists and catalogs	4	3	2	1
7.5 Maintains customer relations	4	3	2	1
7.6 Supervises and manages labor	4	3	2	1
7.7 Practices agricultural safety	4	3	2	1
7.8 Manages business finance	4	3	2	1
7.9 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1

When rating the following general employability skills, please consider them in the context of the occupation specific competencies which you just completed. For example, under "Manages resources wisely" consider "Supply and equipment management " (IC) as it relates to "Prepares media mixes" (3.6) in the occupational competencies.

RATING: **Please rate all of the following competencies to indicate their importance in full-time entry-level positions.**

4- Very important (V)
3- Important (I)
2- Somewhat important (S)
1- Not important (N)

EMPLOYABILITY SKILLS	**V**	**I**	**S**	**N**
I. Manages resources wisely				
A. Time management	4	3	2	1
B. Money management	4	3	2	1
C. Supply and equipment management	4	3	2	1
D. Personnel management	4	3	2	1
II. Exhibits strong interpersonal skills				
A. Works as a team member	4	3	2	1
B. Helps to teach others	4	3	2	1
C. Assists clients/customers	4	3	2	1
D. Shows leadership	4	3	2	1
E. Mediates decision making	4	3	2	1
F. Interacts well with other cultures	4	3	2	1
III. Uses information appropriately				
A. Collects pertinent information	4	3	2	1
B. Interprets information	4	3	2	1
C. Disseminates information	4	3	2	1
D. Processes information with computers	4	3	2	1
IV. Understands complex relationships				
A. Monitors and corrects performance	4	3	2	1
B. Improves and/or designs systems	4	3	2	1
V. Uses technology appropriately				
A. Interprets technology	4	3	2	1
B. Applies technology	4	3	2	1
C. Evaluates technology	4	3	2	1

RATING: Please rate all of the following competencies to indicate their importance in full-time entry-level positions.

4- Very important (V)
3- Important (I)
2- Somewhat important (S)
1- Not important (N)

EMPLOYABILITY SKILLS	V	I	S	N
VI. Possesses critical skills				
A. Reading	4	3	2	1
B. Writing	4	3	2	1
C. Mathematics	4	3	2	1
D. Listening	4	3	2	1
E. Speaking	4	3	2	1
VII. Possesses thinking skills				
A. Creative thinking	4	3	2	1
B. Decision making	4	3	2	1
C. Problem solving	4	3	2	1
D. Adapting to change	4	3	2	1
E. Reasoning	4	3	2	1
VIII. Possesses personal skills				
A. Responsibility	4	3	2	1
B. Self-Esteem	4	3	2	1
C. Self-Motivation	4	3	2	1
D. Social correctness	4	3	2	1
E. Honesty	4	3	2	1

APPENDIX C.2

Landscaping Survey Second Round

ENTRY-LEVEL COMPETENCIES IN LANDSCAPING OCCUPATIONS 2ND ROUND DELPHI SURVEY

INSTRUCTIONS: The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. ***Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business. Also, please rate the new competencies that are indicated in bold type.***

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

LANDSCAPING COMPETENCIES	Your 1st response	1st Round Average	Please mark your 2nd response V	I	S	N
1. Drafts Landscape and Irrigation Plans						
1.1 Identifies drafting equipment		**2**	4	3	2	1
1.2 Draws landscape and irrigation plans to scale		**3**	4	3	2	1
1.3 Prepares plans for blueprinting and presentation		**3**	4	3	2	1
1.4 Draws legible plans			4	3	2	1
Explanation: (If 2nd round answer is different from 1st round average) _____						
2. Designs Landscapes (Excluding Irrigation)						
2.1 Identifies basic principles of landscape design		**3**	4	3	2	1
2.2 Identifies plant requirements and value before beginning a landscape design		**3**	4	3	2	1
2.3 Identifies landscape plants by common and botanical names		**3**	4	3	2	1
2.4 Selects appropriate complements		**3**	4	3	2	1
2.5 Makes preliminary sketches suitable for client evaluation		**2**	4	3	2	1
Explanation: _____						
Agreement -Not Important as a competency						
2.6 Uses color to enhance finished plans						

INSTRUCTIONS**: The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. **Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business. Also, please rate the new competencies that are indicated in bold type.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

LANDSCAPING COMPETENCIES	Your 1st response	1st Round Average	Please mark your 2nd response V	I	S	N
3. Installs Landscapes (Excluding Irrigation)						
3.1 Receives & delivers landscape products		**3**	4	3	2	1
3.4 Harvest transport & install plant material		**3**	4	3	2	1
3.5 Prepares the location to be landscaped		**3**	4	3	2	1
3.6 Prepares media mixes		**3**	4	3	2	1
3.9 Develops bid for a landscape job		**3**	4	3	2	1
Explanation: _____						
Agreement- Important as a competency						
3.7 Demonstrates the correct way to plant shrubs, trees, vines, ground covers, and plants						
3.8 Cleans up the job						
Agreement - NOT Important as a competency						
3.3 Propagates plants						
3.2 Test soil, water, and plant tissues						
4. Maintain Exterior Landscape (Excluding turf)						
4.1 Applies appropriate fertilizers		**3**	4	3	2	1
4.5 Repairs equipment		**3**	4	3	2	1
Explanation: _____						
Agreement- Important as a competency						
4.2 Plans and controls for diseases						
4.3 Plans and controls for weeds						
4.4 Plans and controls for pests						
4.6 Maintains upkeep of lawn						

***INSTRUCTIONS**: The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business. Also, please rate the new competencies that are indicated in bold type.*

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

LANDSCAPING COMPETENCIES	Your 1st response	1st Round Average	Please mark your 2nd response V	I	S	N
5. Install Residential & Commercial Turf Areas						
Agreement- Important as a competency						
5.1 Identifies turf species commonly used						
5.2 Identifies characteristics of turf species						
5.3 Selects appropriate turf species						
5.4 Prepares soil for installing turf						
5.5 Install turf using sod, stolons, plugs, or seed						
5.6 Irrigates new turf for optimum growth						
6. Maintain Residential & Commercial Turf						
6.1 Applies appropriate fertilizers		**3**	4	3	2	1
6.2 Plans and controls for diseases		**3**	4	3	2	1
6.3 Plans and controls for weeds		**3**	4	3	2	1
6.4 Plans and controls for pests		**3**	4	3	2	1
6.5 Repairs equipment						
Explanation: _____						
_____						
Agreement- Important as a competency						
6.6 Maintains upkeep of lawn						
7. Landscape Business Management						
7.1 Understands landscaping/turf industry		**3**	4	3	2	1
7.2 Prepare estimates/ establish contracts		**3**	4	3	2	1
7.3 Designs and sells landscape projects		**3**	4	3	2	1
7.4 Uses/maintains price lists and catalogs		**3**	4	3	2	1
7.8 Manages business finance		**3**	4	3	2	1
Explanation: _____						
_____						
Agreement- Important as a competency						
7.5 Maintains customer relations						
7.6 Supervises and manages labor						
7.7 Practices agricultural safety						

INSTRUCTIONS: The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

EMPLOYABILITY SKILLS-LANDSCAPING	Your 1st response	1st round average	Please mark your 2nd response V	I	S	N
I. Manages resources wisely *Agreement - Important as a competency* *A. Time management* *B. Money management* *C. Supply and equipment management* *D. Personnel management*						
II. Exhibits strong interpersonal skills *Agreement - Important as a competency* *A. Works as a team member* *B. Helps to teach others* *C. Assists clients/customers* *D. Shows leadership* *E. Mediates decision making* *F. Interacts well with other cultures*						
III. Uses information appropriately D. Processes information with computers Explanation: _____ _____ *Agreement - Important as a competency* *A. Collects pertinent information* *B. Interprets information* *C. Disseminates information*		3	4	3	2	1
IV. Understands complex relationships *Agreement- Important as a competency* *A. Monitors and corrects performance* *B. Improves and/or designs systems*						

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*INSTRUCTIONS: The average response from the first round has been rounded off to the nearest whole number and is indicated in **bold** in the second column. Your individual first round response is underlined and indicated in the first column. **Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business.***

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

EMPLOYABILITY SKILLS-NURSERY

	Your 1st response	1st round average	Please mark your 2nd response V	I	S	N
V. Uses technology appropriately						
A. Interprets technology		2	4	3	2	1
B. Applies technology		3	4	3	2	1
C. Evaluates technology		2	4	3	2	1
Explanation: _____						
VI. Possesses critical skills						
Agreement - Important as a competency						
A. Reading						
B. Writing						
C. Mathematics						
D. Listening						
VII. Possesses thinking skills						
Agreement- Important as a competency						
A. Creative thinking						
B. Decision making						
C. Problem solving						
D. Adapting to change						
E. Reasoning						
VIII. Possesses personal skills						
D. Social Correctness		3	4	3	2	1
Explain: _____						
Agreement - Important as a competency						
A. Responsibility						
B. Self-Esteem						
C. Self-Motivation						
E. Honesty						

APPENDIX D.1

Nursery & Greenhouse Survey First Round

ENTRY-LEVEL COMPETENCIES IN GREENHOUSE & NURSERY PRODUCTION

DEMOGRAPHICS

1. Type of business _____

2. Name and address of business _____

_____

3. Number of employees _____

4. Years of experience in horticulture _____

5. Position title _____

RATING: Please rate the following competencies to indicate their importance in full-time entry-level positions needed in your business.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N).

NURSERY AND GREENHOUSE PRODUCTION COMPETENCIES	V	I	S	N
1. Comprehends basic plant science				
1.1 Describes basic principles of plant growth	4	3	2	1
1.2 Identifies plants by common and scientific name	4	3	2	1
1.3 Demonstrates understanding of the nursery industry	4	3	2	1
1.4 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
2. Propagates plants, seeds, and cuttings				
2.1 Tests soil, water, and plant tissues	4	3	2	1
2.2 Prepares soil and media mixes	4	3	2	1
2.3 Applies rooting hormones	4	3	2	1
2.4 Labels planted specimens	4	3	2	1
2.5 Plants bulbs	4	3	2	1
2.6 Plants seeds	4	3	2	1
2.7 Plants shrubs and trees	4	3	2	1
2.8 Sticks cuttings for rooting	4	3	2	1
2.9 Removes rooted cuttings	4	3	2	1
2.10 Labels plants and cuttings	4	3	2	1
2.11 Transplants plants	4	3	2	1
2.12 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1

RATING: Please rate the following competencies to indicate their importance in full-time entry-level positions needed in your business.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

NURSERY AND GREENHOUSE PRODUCTION COMPETENCIES	V	I	S	N
5. Develops skills in merchandise handling				
5.1 Verify received merchandise	4	3	2	1
5.2 Maintains current inventory	4	3	2	1
5.3 Prepares estimates	4	3	2	1
5.4 Uses price lists and catalogs	4	3	2	1
5.5 Sleeves plants	4	3	2	1
5.6 Stores plants and supplies correctly	4	3	2	1
5.7 Performs routine maintenance when needed	4	3	2	1
5.8 Prepares for overwintering of plants	4	3	2	1
5.9 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
6. Develops skills in marketing and sales				
6.1 Conditions plants for sale	4	3	2	1
6.2 Prepares plants for display	4	3	2	1
6.3 Attaches care cards to plants	4	3	2	1
6.4 Displays plants effectively	4	3	2	1
6.5 Assists customers with tree and shrub selection	4	3	2	1
6.6 Assists customers with flower and plant selection	4	3	2	1
6.7 Takes orders by phone and fax	4	3	2	1
6.8 Writes up customer orders	4	3	2	1
6.9 Conducts sales transactions	4	3	2	1
6.10 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1

When rating the following general employability skills, please consider them in the context of the occupation specific competencies which you just completed. For example, under "Manages resources wisely" consider "Supply and equipment management " (IC) as it relates to "Prepares media mixes" (3.6) in the occupational competencies.

RATING: Please rate all of the following competencies to indicate their importance in full-time entry-level positions.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

EMPLOYABILITY SKILLS	V	I	S	N
I. Manages resources wisely				
A. Time management	4	3	2	1
B. Money management	4	3	2	1
C. Supply and equipment management	4	3	2	1
D. Personnel management	4	3	2	1
II. Exhibits strong interpersonal skills				
A. Works as a team member	4	3	2	1
B. Helps to teach others	4	3	2	1
C. Assists clients/customers	4	3	2	1
D. Shows leadership	4	3	2	1
E. Mediates decision making	4	3	2	1
F. Interacts well with other cultures	4	3	2	1
III. Uses information appropriately				
A. Collects pertinent information	4	3	2	1
B. Interprets information	4	3	2	1
C. Disseminates information	4	3	2	1
D. Processes information with computers	4	3	2	1
IV. Understands complex relationships				
A. Monitors and corrects performance	4	3	2	1
B. Improves and/or designs systems	4	3	2	1
V. Uses technology appropriately				
A. Interprets technology	4	3	2	1
B. Applies technology	4	3	2	1
C. Evaluates technology	4	3	2	1

RATING: Please rate all of the following competencies to indicate their importance in full-time entry-level positions.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

EMPLOYABILITY SKILLS	V	I	S	N
VI. Possesses critical skills				
A. Reading	4	3	2	1
B. Writing	4	3	2	1
C. Mathematics	4	3	2	1
D. Listening	4	3	2	1
E. Speaking	4	3	2	1
VII. Possesses thinking skills				
A. Creative thinking	4	3	2	1
B. Decision making	4	3	2	1
C. Problem solving	4	3	2	1
D. Adapting to change	4	3	2	1
E. Reasoning	4	3	2	1
VIII. Possesses personal skills				
A. Responsibility	4	3	2	1
B. Self-Esteem	4	3	2	1
C. Self-Motivation	4	3	2	1
D. Social correctness	4	3	2	1
E. Honesty	4	3	2	1

APPENDIX D.2

Nursery & Greenhouse Survey Second Round

ENTRY-LEVEL COMPETENCIES IN
NURSERY AND GREENHOUSE OCCUPATIONS
2ND ROUND DELPHI SURVEY

INSTRUCTIONS: The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business. Also, please rate the new competencies that are indicated in bold type.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

NURSERY & GREENHOUSE COMPETENCIES	Your 1st response	1st Round Average	Please mark your 2nd response V	I	S	N
1. Comprehends basic plant science						
1.2 Identify plant by common & scientific name		3	4	3	2	1
1.3 Demonstrates understanding of the nursery industry		2	4	3	2	1
1.4 Control pathogens and diseases		**NEW**	4	3	2	1
Explanation: _____						
Agreement - Important as a competency						
1.1 Describes basic principles of plant growth						
2. Propagates plants, seeds, and cuttings						
2.3 Applies rooting hormones		2	4	3	2	1
2.4 Labels planted specimens		3	4	3	2	1
2.8 Sticks cuttings for rooting		2	4	3	2	1
2.9 Removes tooted cuttings		2	4	3	2	1
2.11 Transplants plants		3	4	3	2	1
2.12 Sanitization of plants		**NEW**	4	3	2	1
Explanation: _____						
Agreement - Not important as a competency						
2.1 Tests soil, water, & plant tissues						
2.2 Prepares soil and media mixes						
2.5 Plants bulbs						
2.6 Plants seeds						
2.7 Plants plants shrubs and trees						

INSTRUCTIONS: *The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. Please re-rate only the competencies on which agreement was not reached to indicatedtheir importance in full-time entry-level positions associated with your business. Also, please rate the new competencies that are indicated in bold type.*

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

NURSERY & GREENHOUSE COMPETENCIES	Your 1st response	1st Round Average	Please mark your 2nd response V	I	S	N
3. Controls plant environment for optimum growth						
3.2 Pinches plants		**2**	4	3	2	1
3.3 Maintains proper temperature		**3**	4	3	2	1
3.4 Applies appropriate fertilizers		**3**	4	3	2	1
3.6 Plans and controls for weeds		**3**	4	3	2	1
3.8 Repairs equipment and facilities		**3**	4	3	2	1
3.9 Operates equipment		**3**	4	3	2	1
Explanation: _____						
Agreement - Important as a competency						
3.5 Plans and controls for diseases						
3.6 Plans and controls for pests						
Agreement - NOT important as a competency						
3.1 Adds mulch						
4. Harvests plants						
4.3 Selects and prepares plants for sale		**3**	4	3	2	1
4.6 Grows container nursery stock		**2**	4	3	2	1
4.9 Grows various crops (Ex. mums, lillies)		**2**	4	3	2	1
4.10 Grows bedding plants		**NEW**	4	3	2	1
Explanation: _____						
Agreement- NOT important as a competency						
4.1 Harvests cut flowers						
4.2 Prepares and places cut flowers in water						
4.4 Harvests bulbs						
4.5 Digs and burlaps shrubs and trees						
4.7 Forces potted bulbs						
4.8 Grows small fruit and nuts						

***INSTRUCTIONS**: The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business. Also, please rate the new competencies that are indicated in bold type.*

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

NURSERY & GREENHOUSE COMPETENCIES	Your 1st response	1st Round Average	Please mark your 2nd response V	I	S	N
5. Develops skills in merchandise handling						
5.3 Prepares estimates		**2**	4	3	2	1
5.5 Sleeves plants		**2**	4	3	2	1
Explain: _____						
Agreement- Important as a competency						
5.1 Verify received merchandise						
5.2 Maintains current inventory						
5.4 Uses price lists and catalogs						
5.6 Stores plants and supplies correctly						
5.7 Performs routine maintenance if needed						
5.8 Prepares for overwintering of plants						
6. Develops skills in marketing and sales						
6.2 Prepares plants for display		**3**	4	3	2	1
6.3 Attaches care cards to plants		**2**	4	3	2	1
6.7 Takes orders by phone and/or fax		**3**	4	3	2	1
6.8 Writes up customer orders		**3**	4	3	2	1
6.11 Act as consultant for customers		**NEW**	4	3	2	1
Explain: _____						
Agreement - Important as a competency						
6.1 Conditions plants for sale						
6.4 Displays plants effectively						
6.5 Assist customers with tree/shrub selection						
6.6 Assist customers with flower/plant selection						
6.9 Conducts sales transactions						

***INSTRUCTIONS**: The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business.*

4- Very important (V)
3- Important (I)
2- Somewhat important (S)
1- Not important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

EMPLOYABILITY SKILLS-NURSERY

	Your 1st response	1st round average	Please mark your 2nd response V	I	S	N
I. Manages resources wisely						
B. Money management		3	4	3	2	1
C. Supply and equipment management		3	4	3	2	1
D. Personnel management		3	4	3	2	1
Explain: (If 2nd round answer is different from 1st round average)_____						
Agreement - Important as a competency						
A. Time management						
II. Exhibits strong interpersonal skills						
E. Mediates decision making		3	4	3	2	1
Explanation:_____						
Agreement - Important as a competency						
A. Works as a team member						
B. Helps to teach others						
C. Assists clients/customers						
D. Shows leadership						
F. Interacts well with other cultures						
III. Uses information appropriately						
D. Processes information with computers		2	4	3	2	1
Explanation: _____						
Agreement - Important as a competency						
A. Collects pertinent information						
B. Interprets information						
C. Disseminates information						
IV. Understands complex relationships						
A. Monitors and corrects performance		2	4	3	2	1
B. Improves and/or designs systems		2	4	3	2	1
Explanation: _____						

INSTRUCTIONS: *The average response from the first round has been rounded off to the nearest whole number and is indicated in bold in the second column. Your individual first round response is underlined and indicated in the first column. Please re-rate only the competencies on which agreement was not reached to indicate their importance in full-time entry-level positions associated with your business.*

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

If your second round response for any competency is not in agreement with the first round average, please explain in the space provided.

EMPLOYABILITY SKILLS-NURSERY

	Your 1st response	1st round average	Please mark your 2nd response V	I	S	N
V. Uses technology appropriately						
A. Interprets technology		2	4	3	2	1
B. Applies technology		3	4	3	2	1
C. Evaluates technology		2	4	3	2	1
Explanation:_____						
VI. Possesses critical skills						
Agreement - Important as a competency						
A. Reading						
B. Writing						
C. Mathematics						
D. Listening						
VII. Possesses thinking skills						
A. Creative thinking		3	4	3	2	1
Explain: _____						
Agreement- Important as a competency						
B. Decision making						
C. Problem solving						
D. Adapting to change						
E. Reasoning						
VIII. Possesses personal skills						
D. Social Correctness		3	4	3	2	1
Explain: _____						
Agreement - Important as a competency						
A. Responsibility						
B. Self-Esteem						
C. Self-Motivation						
E. Honesty						

APPENDIX E.1

Fruit & Vegetable Production Survey First Round

ENTRY-LEVEL COMPETENCIES IN VEGETABLE & FRUIT PRODUCTION

DEMOGRAPHICS

1. Type of business _____
2. Name and address of business _____
   _____
3. Number of employees _____
4. Years of experience in horticulture _____
5. Position title _____

RATING: Please rate the following competencies to indicate their importance in full-time entry-level positions needed in your business.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

VEGETABLE AND FRUIT PRODUCTION COMPETENCIES	V	I	S	N
1. Comprehends basic plant science				
1.1 Describes basic principles of fruit and vegetable growth	4	3	2	1
1.2 Identifies fruits and vegetables by common and scientific name	4	3	2	1
1.3 Demonstrates understanding of fruit and vegetable industry	4	3	2	1
1.4 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
2. Determines the needs of vegetable production				
2.1 Identifies economic feasibility	4	3	2	1
2.2 Identifies requirements for successful vegetable production	4	3	2	1
2.3 Determines appropriate site for vegetable production	4	3	2	1
2.4 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1

RATING: Please rate the following competencies to indicate their importance in full-time entry-level positions needed in your business.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

VEGETABLE AND FRUIT PRODUCTION COMPETENCIES	V	I	S	N
3. Plans and designs a vegetable production site				
3.1 Identifies the five planting groups	4	3	2	1
3.2 Selects appropriate vegetables for each of the planting groups	4	3	2	1
3.3 Describes suggestions for production sitelayout	4	3	2	1
3.4 Explains advantages of organic gardening	4	3	2	1
3.5 Describes ways to manage vegetable production	4	3	2	1
3.6 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
4. Plants vegetables				
4.1 Applies soil test to location to determine nutrient needs	4	3	2	1
4.2 Prepares soil prior to planting	4	3	2	1
4.3 Identifies and explains the value of soil organic matter	4	3	2	1
4.4 Determines appropriate conditions for planting	4	3	2	1
4.5 Prepares appropriate conditions for planting	4	3	2	1
4.6 Germinates and transplants seeds	4	3	2	1
4.7 Discusses benefits of mulching	4	3	2	1
4.8 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
5. Maintains healthy vegetables				
5.1 Determines and applies appropriate irrigation system	4	3	2	1
5.2 Applies fertilizers for optimum plant growth	4	3	2	1
5.3 Discusses purpose of cultivation	4	3	2	1
5.4 Diagnoses and controls plant pest problems	4	3	2	1
5.5 Harvests plants at appropriate time	4	3	2	1
5.6 Identifies storing and packing mehods	4	3	2	1
5.7 Markets plants for optimum return	4	3	2	1
5.8 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1

RATING: Please rate the following competencies to indicate their importance in full-time entry-level positions needed in your business.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

VEGETABLE AND FRUIT PRODUCTION COMPETENCIES	V	I	S	N
6. Designs and Plants a Fruit Production Site				
6.1 Determines the needs and value of fruit production	4	3	2	1
6.2 Describes ways to manage fruit production	4	3	2	1
6.3 Prepares soil for planting selected fruits	4	3	2	1
6.4 Explains proper planting methods for fruits	4	3	2	1
6.5 Lists special cultural practices for small fruits	4	3	2	1
6.6 Plants selected fruits appropriately	4	3	2	1
6.7 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
7. Maintains Healthy Fruit				
7.1 Determines and applies appropriate irrigation system	4	3	2	1
7.2 Applies fertilizers for optimum plant growth	4	3	2	1
7.3 Discusses purpose of cultivation	4	3	2	1
7.4 Diagnoses and controls plant pest problems	4	3	2	1
7.5 Harvests plants at appropriate time	4	3	2	1
7.6 Identifies storing and packing mehods	4	3	2	1
7.7 Markets plants for optimum return	4	3	2	1
7.8 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1
7. Develops skills in merchandise handling				
7.1 Maintains current inventory	4	3	2	1
7.2 Harvests fruits and vegetables corectly	4	3	2	1
7.3 Stores fruits and vegetables correctly	4	3	2	1
7.4 Performs routine maintenance on equipment	4	3	2	1
7.5 Prepares for transportation of fruits anf vegetables	4	3	2	1
7.6 Verify received and shipped merchandise	4	3	2	1
7.7 Other (Please specify)				
_____	4	3	2	1
_____	4	3	2	1

When rating the following general employability skills, please consider them in the context of the occupation specific competencies which you just completed. For example, under "Manages resources wisely" consider "Supply and equipment management " (IC) as it relates to "Prepares media mixes" (3.6) in the occupational competencies.

RATING: **Please rate all of the following competencies to indicate their importance in full-time entry-level positions.**

4- Very important (V)
3- Important (I)
2- Somewhat important (S)
1- Not important (N)

EMPLOYABILITY SKILLS	V	I	S	N
I. Manages resources wisely				
A. Time management	4	3	2	1
B. Money management	4	3	2	1
C. Supply and equipment management	4	3	2	1
D. Personnel management	4	3	2	1
II. Exhibits strong interpersonal skills				
A. Works as a team member	4	3	2	1
B. Helps to teach others	4	3	2	1
C. Assists clients/customers	4	3	2	1
D. Shows leadership	4	3	2	1
E. Mediates decision making	4	3	2	1
F. Interacts well with other cultures	4	3	2	1
III. Uses information appropriately				
A. Collects pertinent information	4	3	2	1
B. Interprets information	4	3	2	1
C. Disseminates information	4	3	2	1
D. Processes information with computers	4	3	2	1
IV. Understands complex relationships				
A. Monitors and corrects performance	4	3	2	1
B. Improves and/or designs systems	4	3	2	1
V. Uses technology appropriately				
A. Interprets technology	4	3	2	1
B. Applies technology	4	3	2	1
C. Evaluates technology	4	3	2	1

RATING: Please rate all of the following competencies to indicate their importance in full-time entry-level positions.

4- Very Important (V)
3- Important (I)
2- Somewhat Important (S)
1- Not Important (N)

EMPLOYABILITY SKILLS	V	I	S	N
VI. Possesses critical skills				
A. Reading	4	3	2	1
B. Writing	4	3	2	1
C. Mathematics	4	3	2	1
D. Listening	4	3	2	1
E. Speaking	4	3	2	1
VII. Possesses thinking skills				
A. Creative thinking	4	3	2	1
B. Decision making	4	3	2	1
C. Problem solving	4	3	2	1
D. Adapting to change	4	3	2	1
E. Reasoning	4	3	2	1
VIII. Possesses personal skills				
A. Responsibility	4	3	2	1
B. Self-Esteem	4	3	2	1
C. Self-Motivation	4	3	2	1
D. Social correctness	4	3	2	1
E. Honesty	4	3	2	1

APPENDIX F.1

Validated Competency List for Horticultural Occupations in Texas

Validated Competency List for Floriculture Occupations in the State of Texas

Floriculture Competencies (46):

F1 Comprehends basic plant science
F1.1 Identify plant by common & scientific name
F1.2 Prepares soil & media mixes

F2 Controls the plant environment
F2.1 Control diseases and/or pests
F2.2 Fertilizes plants as needed
F2.3 Maintains clean & sanitized facilities
F2.4 Maintains storage temperature for flowers
F2.5 Removes diseased and/or damaged plants
F2.6 Utilizes appropriate watering techniques

F3 Develops skills in merchandise handling
F3.1 Arranges displays with maximum effect
F3.2 Delivers products to customers efficiently
F3.3 Maintains current inventory
F3.4 Performs routine maintenance when needed
F3.5 Prepares cut flowers for display & purchase
F3.6 Prepares plants for display & purchase
F3.7 Verify received merchandise

F4 Plans floral designs and arrangements
F4.1 Explains rules of color use in floral design
F4.2 Identifies appropriate flowers to be used in an arrangement
F4.3 Identifies appropriate materials to be used in an arrangement
F4.4 Lists & explains the basic rules of flower arrangement
F4.5 Prepares additional materials needed for an arrangement
F4.6 Prepares flowers needed for an arrangement
F4.7 Selects & constructs examples of floral design forms

F5 Designs various floral arrangements
F5.1 Constructs appropriate funeral arrangements
F5.2 Constructs wedding arrangements
F5.3 Constructs wedding nosegays
F5.4 Designs arrangements for holidays
F5.5 Makes various types of boutonnieres
F5.6 Makes various types of corsages
F5.7 Produces a dry flower arrangement

F5.8 Produces a fresh flower arrangement
F5.9 Produces a silk flower arrangement

F6 Maintains interior landscapes
F6.1 Cleans & maintains plants for optimum growth
F6.2 Diagnoses & controls plant pest problems
F6.3 Identifies interior plants by common & botanical name
F6.4 Locates interior plants according to light requirements
F6.5 Markets plants for optimum return
F6.6 Trims interior plants for improved growth & appearance
F6.7 Waters & fertilizes interior plants for optimum growth

F7 Develops skills in marketing and sales
F7.1 Assists customers with plant selection
F7.2 Conducts sales transactions
F7.3 Displays plants & merchandise effectively
F7.4 Prepares plants & merchandise for display
F7.5 Prepares plants & merchandise for marketing
F7.6 Sends & receives wire orders
F7.7 Takes orders by phone & fax
F7.8 Writes up customer orders

Floriculture Employability Skills (33):
F8 Manages resources wisely
F8.1 Money management
F8.2 Personnel management
F8.3 Supply & equipment management
F8.4 Time management

F9 Exhibits strong interpersonal skills
F9.1 Assists clients/customers
F9.2 Helps to teach others
F9.3 nteracts well with other cultures
F9.4 Mediates decision making
F9.5 Shows leadership
F9.6 Works as a team member

F10 Uses information appropriately
F10.1 Collects pertinent information
F10.2 Disseminates information
F10.3 Interprets information

F11 Understands complex relationships
F11.1 Improves and/or designs systems
F11.2 Monitors and/or corrects performance

F12 Uses technology appropriately
F12.1 Applies technology
F12.2 Evaluates technology
F12.3 Interprets technology

F13 Possesses critical skills
F13.1 Listening
F13.2 Mathematics
F13.3 Reading
F13.4 Speaking
F13.5 Writing

F14 Possesses thinking skills
F14.1 Adapting to change
F14.2 Creative thinking
F14.3 Decision making
F14.4 Problem solving
F14.5 Reasoning

F15 Possesses personal skills
F15.1 Honesty
F15.2 Responsibility
F15.3 Self-Esteem
F15.4 Self-Motivation
F15.5 Social correctness

Validated Competency List for
Landscaping Occupations in the State of Texas

Landscaping Competencies (41):

L.1 Drafts Landscape & Irrigation Plans
L1.1 Draws landscape & irrigation plans to scale
L1.2 Draws legible plans
L1.3 Prepares plans for blueprinting & presentation

L.2 Designs Landscapes (Excluding Irrigation)
L2.1 Identifies basic principles of landscape design
L2.2 Identifies landscape plants by common & scientific names
L2.3 Identifies plant requirements and value before beginning a landscape design
L2.4 Makes preliminary sketches suitable for client evaluation
L2.5 Selects appropriate complements

L.3 Installs Landscapes (Excluding Irrigation)
L3.1 Cleans up the job
L3.2 Demonstrates the correct way to plant shrubs, trees, vines, ground covers, and
L3.3 Develops bid for a landscape job
L3.4 Harvest transport & install plant material
L3.5 Prepares media mixes
L3.6 Prepares the location to be landscaped
L3.7 Receives & delivers landscape products

L.4 Maintain Exterior Landscape (Excluding turf)
L4.1 Applies appropriate fertilizers
L4.2 Maintains upkeep of lawn
L4.3 Plans & controls for pests
L4.4 Plans & controls for weeds
L4.5 Plans &controls for diseases
L4.6 Repairs equipment

L5 Install Residential & Commercial Turf Areas
L5.1 Identifies characteristics of turf species
L5.2 Identifies turf species commonly used
L5.3 Install turf using sod, stolons, plugs, or seed
L5.4 Irrigates new turf for optimum growth
L5.5 Prepares soil for installing turf
L5.6 Selects appropriate turf species

L6 Maintain Residential & Commercial Turf
L6.1 Applies appropriate fertilizers
L6.2 Maintains upkeep of lawn
L6.3 Plans & controls for diseases
L6.4 Plans & controls for pests
L6.5 Plans & controls for weeds
L6.6 Repairs equipment

L7 Landscape Business Management
L7.1 Designs & sells landscape projects
L7.2 Maintains customer relations
L7.3 Manages business finance
L7.4 Practices agricultural safety
L7.5 Prepare estimates/ establish contracts
L7.6 Supervises & manages labor
L7.7 Understands landscaping/turf industry
L7.8 Uses/maintains price lists & catalogs

Landscaping Employability Skills (32):
L9 Manages resources wisely
L9.1 Money management
L9.2 Personnel management
L9.3 Supply & equipment management
L9.4 Time management

L10 Exhibits strong interpersonal skills
L10.1 Assists clients/customers
L10.2 Helps to teach others
L10.3 Interacts well with other cultures
L10.4 Mediates decision making
L10.5 Shows leadership
L10.6 Works as a team member

L11 Uses information appropriately
L11.1 Collects pertinent information
L11.2 Disseminates information
L11.3 Processes information with computers

L12 Understands complex relationships
L12.1 Improves and/or designs systems
L12.2 Monitors and/or corrects performance

L13 Uses technology appropriately
L13.1 Applies technology

L14 Possesses critical skills
L14.1 Listening
L14.2 Mathematics
L14.3 Reading
L14.4 Speaking
L14.5 Writing

L15 Possesses thinking skills
L15.1 Adapting to change
L15.2 Creative thinking
L15.3 Decision making
L15.4 Problem solving
L15.5 Reasoning

L16 Possesses personal skills
L16.1Honesty
L16.2 Responsibility
L16.3 Self-Esteem
L16.4 Self-Motivation
L16.5 Social Correctness

Validated Competency List for
Nursery and Greenhouse Occupations
in the State of Texas

Nursery and Greenhouse Competencies (20):

N1 Comprehends basic plant science
N1.1 Describes basic principles of plant growth

N2 Propagates plants, seeds, and cuttings
N2.1 Labels planted specimens

N3 Controls plant environment for optimum growth
N3.1 Operates equipment
N3.2 Plans and controls for diseases
N3.3 Plans and controls for pests

N4 Harvests plants
N4.1 Selects and prepares plants for sale

N5 Develops skills in merchandise handling
N5.1 Maintains current inventory
N5.2 Performs routine maintenance if needed
N5.3 Prepares for overwintering of plants
N5.4 Stores plants and supplies correctly
N5.5 Uses price lists and catalogs
N5.6 Verify received merchandise

N6 Develops skills in marketing and sales
N6.1 Act as consultant for customers
N6.2 Assist customers with flower/plant selection
N6.3 Assist customers with tree/shrub selection
N6.4 Conditions plants for sale
N6.5 Conducts sales transactions
N6.6 Displays plants effectively
N6.7 Prepares plants for display
N6.8 Writes up customer orders

Nursery and Greenhouse Employability Skills (24):

N7 Manages resources wisely
N7.1 Time management

N8 Exhibits strong interpersonal skills
N8.1 Assists clients/customers
N8.2 Helps to teach others
N8.3 Interacts well with other cultures
N8.4 Mediates decision making
N8.5 Shows leadership
N8.6 Works as a team member

N9 Uses information appropriately
N9.1 Collects pertinent information
N9.2 Disseminates information
N9.3 Interprets information

N10 Uses technology appropriately
N10.1 Applies technology

N11 Possesses critical skills
N11.1 Listening
N11.2 Mathematics
N11.3 Reading
N11.4 Speaking
N11.5 Writing

N12 Possesses thinking skills
N12.1 Adapting to change
N12.2 Decision making
N12.3 Problem solving
N12.4 Reasoning

N13 Possesses personal skills
N13.1 Honesty
N13.2 Responsibility
N13.3 Self-Esteem
N13.4 Self-Motivation

APPENDIX G.1

Employability Skills Questionnaire: Child Care -- Secondary Round 1

TEXAS TECH UNIVERSITY

Home Economics Education

Box 41162
Lubbock, TX 79409-1162

January 10, 1994

Dear Child Care Professional:

Because of your expertise in the area of child care, you have been selected to complete the **Employability Skills Questionnaire: Child Care**. We need your expertise to validate competencies which will be used to plan programs that prepare students for careers in child care occupations.

The packet of materials you are receiving includes the **Employability Skills Questionnaire: Child Care**, the Child Care Competencies used in Texas, and the list of Employability Skills published by the U.S. Department of Labor. The Child Care Competencies serve as a standard for students who complete secondary (high school) programs which prepare them for child care occupations. These programs prepare students for entry-level positions such as child care worker, teaching assistant, and home child care provider.

You are requested to do the following:

- Refer to the list of Child Care Competencies, as needed, to define the 7 Child Care areas (Professionalism, Human Growth, Guidance, Curriculum, etc.) Refer to the Employability Skills, as needed, for clarification of employability skills.

- Complete the **Employability Skills Questionnaire: Child Care** by rating the importance of each Employability Skill for each of the seven areas. For example: If you think "Manages Time" is very important for Professionalism and not important for Human Growth, you would respond this way for #1:

	Professionalism	Human Growth
1. Manages Time	(4) 3 2 1	4 3 2 (1)

- **Please return the Questionnaire by <u>January 21, 1994</u>.**

As part of a research project funded by the Texas Education Agency, Texas Tech University researchers are using the Delphi method to validate employability skills related to child care competencies. The enclosed questionnaire is the first step of the Delphi research process. After the results of "round one" have been tabulated, we will revise the questionnaire and return it to you. At that time you will be able to compare your ratings with the mean of all responses. Our goal is to reach consensus on the employability skill levels that professionals believe are important for child care workers completing secondary programs.

Your participation will help to ensure that students preparing for child care occupations develop necessary employability skills. Thank you for your time. If you have questions, please contact me at (806) 742-3068.

Sincerely,

Ginny Felstehausen

Ginny Felstehausen, Ph. D.

An Affirmative Action Institution

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CHILD CARE COMPETENCIES

Directions: Please check (/) each best answer. Answer where appropriate.

1. Number of years in child care_____

2. Number of years in present position_____

3. Position title_____

4. Number of children enrolled at facility_____

5. Number of teachers/caregivers at facility_____

6. Is your facility? (Check all that apply.)
   _____private
   _____not-for-profit
   _____government supported
   _____CCMS Vendor
   _____NAEYC Accredited
   _____corporate-sponsored

7. Is your facility a designated training site for high school students enrolled in Child Care programs?
   _____Yes
   _____No

8. If so, what is the name of the high school(s)?_____

Which best describes the educational background of employees at your facility?

9. High School diploma
   _____All
   _____Most
   _____Some
   _____None

10. Employee training in child development beyond high school
   _____All
   _____Most
   _____Some
   _____None

11. Employees with Child Development Associate Credential
   _____All
   _____Most
   _____Some
   _____None

12. Which best describes the number of applicants for caregiver positions?
   _____Many qualified applicants for each position
   _____Position is filled without interruption at facility
   _____Position is difficult to fill with qualified applicant
   _____Other_____

Please Continue --->

EMPLOYABILITY SKILLS QUESTIONNAIRE: CHILD CARE

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Secondary Professionalism	Human Growth	Guidance	Curriculum
1. Manages Time.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
2. Manages Money.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
3. Manages Material &..... Facilities	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
4. Manages Human Resources	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
5. Participates as..... Member of a Team	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
6. Teaches Others New..... Skills	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
7. Serves Clients/..... Customers	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
8. Exercises Leadership...	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
9. Negotiates.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
10. Works with Diversity...	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
11. Acquires & Evaluates... Information	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
12. Organizes & Maintains.. Information	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
13. Interprets &..... Communicates Information	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
14. Uses Computers to..... Process Information	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
15. Understands Systems....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
16. Monitors & Corrects.... Performance	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
17. Improves or Designs.... Systems	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1

Please continue --->

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

CHILD CARE COMPETENCIES--Secondary

EMPLOYABILITY SKILLS	Family/Community	Safety, Health	Program Mgt.
1. Manages Time.....	4 3 2 1	4 3 2 1	4 3 2 1
2. Manages Money.....	4 3 2 1	4 3 2 1	4 3 2 1
3. Manages Material &..... Facilities	4 3 2 1	4 3 2 1	4 3 2 1
4. Manages Human Resources	4 3 2 1	4 3 2 1	4 3 2 1
5. Participates as..... Member of a Team	4 3 2 1	4 3 2 1	4 3 2 1
6. Teaches Others New..... Skills	4 3 2 1	4 3 2 1	4 3 2 1
7. Serves Clients/..... Customers	4 3 2 1	4 3 2 1	4 3 2 1
8. Exercises Leadership...	4 3 2 1	4 3 2 1	4 3 2 1
9. Negotiates.....	4 3 2 1	4 3 2 1	4 3 2 1
10. Works with Diversity...	4 3 2 1	4 3 2 1	4 3 2 1
11. Acquires & Evaluates... Information	4 3 2 1	4 3 2 1	4 3 2 1
12. Organizes & Maintains.. Information	4 3 2 1	4 3 2 1	4 3 2 1
13. Interprets &..... Communicates Information	4 3 2 1	4 3 2 1	4 3 2 1
14. Uses Computers to..... Process Information	4 3 2 1	4 3 2 1	4 3 2 1
15. Understands Systems....	4 3 2 1	4 3 2 1	4 3 2 1
16. Monitors & Corrects.... Performance	4 3 2 1	4 3 2 1	4 3 2 1
17. Improves or Designs.... Systems	4 3 2 1	4 3 2 1	4 3 2 1

Please continue --->

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Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Secondary Professionalism	Human Growth	Guidance	Curriculum
18. Selects Technology.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
19. Applies Technology to.. Task	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
20. Maintains & Trouble-... shoots Equipment	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
21. Reading.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
22. Writing.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
23. Arithmetic/Mathematics.	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
24. Listening.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
25. Speaking.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
26. Creative Thinking.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
27. Decision Making.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
28. Problem Solving.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
29. Seeing Things in..... the Mind's Eye	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
30. Knowing How to Learn...	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
31. Reasoning.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
32. Responsibility.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
33. Self-Esteem.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
34. Sociability.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
35. Self-Management.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
36. Integrity/Honesty.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1

Please continue---→

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Circle: 4=very important:
3=important:
2=somewhat important:
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Secondary Family/Community	Safety, Health	Program Mgt.
18. Selects Technology.....	4 3 2 1	4 3 2 1	4 3 2 1
19. Applies Technology to.. Task	4 3 2 1	4 3 2 1	4 3 2 1
20. Maintains & Trouble-... shoots Equipment	4 3 2 1	4 3 2 1	4 3 2 1
21. Reading.....	4 3 2 1	4 3 2 1	4 3 2 1
22. Writing.....	4 3 2 1	4 3 2 1	4 3 2 1
23. Arithmetic/Mathematics.	4 3 2 1	4 3 2 1	4 3 2 1
24. Listening.....	4 3 2 1	4 3 2 1	4 3 2 1
25. Speaking.....	4 3 2 1	4 3 2 1	4 3 2 1
26. Creative Thinking.....	4 3 2 1	4 3 2 1	4 3 2 1
27. Decision Making.....	4 3 2 1	4 3 2 1	4 3 2 1
28. Problem Solving.....	4 3 2 1	4 3 2 1	4 3 2 1
29. Seeing Things in..... the Mind's Eye	4 3 2 1	4 3 2 1	4 3 2 1
30. Knowing How to Learn...	4 3 2 1	4 3 2 1	4 3 2 1
31. Reasoning.....	4 3 2 1	4 3 2 1	4 3 2 1
32. Responsibility.....	4 3 2 1	4 3 2 1	4 3 2 1
33. Self-Esteem.....	4 3 2 1	4 3 2 1	4 3 2 1
34. Sociability.....	4 3 2 1	4 3 2 1	4 3 2 1
35. Self-Management.....	4 3 2 1	4 3 2 1	4 3 2 1
36. Integrity/Honesty.....	4 3 2 1	4 3 2 1	4 3 2 1

Thank you for your time and participation.

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APPENDIX G.2

Child Care Competencies -- Secondary

CHILD CARE COMPETENCIES--Secondary
(For Reference Only)

PROFESSIONALISM
Practice the characteristics of an early childhood education professional.
Demonstrate the skills needed to locate and obtain employment.
Demonstrate a knowledge of early childhood professional organizations.
Identify current issues and legislation relating to early childhood care and education.

HUMAN GROWTH
Describe major child development theories.
Practice behaviors that promote healthy development in children.
Plan age appropriate learning environments for children.
Explain interventions to use when working with special needs children.

GUIDANCE
Practice components of effective communication with children.
Identify major guidance approaches in early childhood education.
Practice guidance approaches when working with children.
Practice teacher behaviors which facilitate learning activities.
Practice guidance approaches when working with children who have persistent social and/or emotional problems.

CURRICULUM
Evaluate the use of a developmentally appropriate curriculum with young children.
Plan and teach a developmentally appropriate unit study for young children.
Plan implementation of major content areas in an early childhood setting.
Plan ways to adapt the curriculum for special needs children.

FAMILY/COMMUNITY
Evaluate an early childhood education program for multi-cultural and non-sexist themes.
Plan communication strategies to strengthen parent/child care provider relationships.
Demonstrate an understanding of the role of the Department of Human Services in child care settings.
Plan advocacy activities to strengthen developmentally appropriate child care programs in the community.

SAFETY, HEALTH AND NUTRITION
Apply safety rules and procedures in a child care setting.
Utilize health and nutrition practices in a child care setting.

PROGRAM MANAGEMENT
Identify the administrative duties of an entry level early childhood professional.
Assist with management procedures and policies.
Demonstrate an understanding of the Texas Department of Human Services Minimum Standards For Day Care Center.

Patton, M. M., & Harriman, M. W. (1991). 2 + 2 Tech Prep Early Childhood Professions I Curriculum Guide. Austin: Texas Education Agency.

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APPENDIX G.3
SCANS Supplement

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EMPLOYABILITY SKILLS
(For Reference Only)

1. **Time** - Selects & ranks goal-relevant activities, allocates time, & prepares & follows schedules.

2. **Money** - Uses or prepares budgets, makes forecasts, keeps records, and make adjustments to meet objectives.

3. **Material and Facilities** - Acquires, stores, allocates, and uses materials or space efficiently.

4. **Human Resources** - Assesses skills and distributes work accordingly, evaluates performance and provides feedback.

5. **Participates as Member of a Team** - Contributes to group effort.

6. **Teaches Others New Skills**

7. **Serves Clients/Customers** - Works to satisfy customer's expectations.

8. **Exercises Leadership** - Communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.

9. **Negotiates** - Works toward agreements involving exchange .

10. **Works with Diversity** - Works well with men and women from diverse backgrounds.

11. **Acquires and Evaluates Information**

12. **Organizes and Maintains Information**

13. **Interprets and Communicates Information**

14. **Uses Computers to Process Information**

15.* **Understands Systems** - Knows how social, organizational, and technological systems work and operates effectively with them.*

16. **Monitors and Corrects Performance** - Distinguishes trends, predicts impacts on system operations, diagnoses system's performance and corrects malfunctions.

17.* **Improves or Designs Systems** - Suggests modifications to existing systems and develops new or alternative systems to improve performance.*

18.** **Selects Technology** - Chooses procedures, tools, or equipment including computers and related technologies.**

19.** **Applies Technology to Task** - Understands overall intent and proper procedures for setup and operation of equipment.**

---

*Note that **Systems** could include families; co-worker/staff; institutions such as the government, schools, and churches; and professional organizations.

Note that **Technology could include office machines, TV/VCRs, video games, record players/CDs, and overhead projectors.

20. **Maintains and Troubleshoots Equipment** - Prevents, identifies, or solves problems with equipment, including computers and other technologies.

21. **Reading** - Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.

22. **Writing** - Communicates thoughts, ideas, information, and messages in writing; creates documents such as letters, directions, manuals, reports, graphs, and flow charts.

23. **Arithmetic/Mathematics** - Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.

24. **Listening** - Receives, attends to, interprets, and responds to verbal messages and other cues.

25. **Speaking** - Organizes ideas and communicates orally.

26. **Creative Thinking** - Generates new ideas.

27. **Decision Making** - Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.

28. **Problem Solving** - Recognizes problems and devises and implements plan of action.

29. **Seeing Things in the Mind's Eye** - Organizes and processes symbols, pictures, graphs, objects, and other information.

30. **Knowing How to Learn** - Uses efficient learning techniques to acquire and apply new knowledge and skills.

31. **Reasoning** - Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

32. **Responsibility** - Exerts a high level of effort and perserves towards goal attainment.

33. **Self-esteem** - Believes in own self-worth and maintains a positive view of self.

34. **Sociability** - Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings.

35. **Self-Management** - Assesses self-accurately, sets personal goals, monitors progress, and exhibits self-control.

36. **Integrity/Honesty** - Chooses ethical courses of action.

The Secretary's Commission on Achieving Necessary Skills (1991). What work requires of schools: A SCANS report for America 2000. U.S. Department of Labor.

APPENDIX G.4

Employability Skills Questionnaire: Child Care -- Secondary Round II

TEXAS TECH UNIVERSITY

Home Economics Education

Box 41162
Lubbock, TX 79409-1162

March 1, 1994

Dear Child Care Professional:

Thank you for your participation in the **Employability Skills Questionnaire: Child Care**. A great deal of agreement was reached during the first round. You will not re-rate items for which there was agreement, and "AGREE" will appear in the appropriate box. There are 64 items for which agreement was not reached. We are asking you to rate these items again.

This packet of materials contains the **Employability Skills Questionnaire: Child Care II**, the Child Care Competencies used in Texas, and the list of Employability Skills published by the U.S. Department of Labor. The Child Care Competencies serve as a standard for students who complete secondary (high school) programs which prepare them for child care occupations. These programs prepare students for entry-level positions such as child care worker, teaching assistant, and home child care provider.

You are requested to do the following:

- Refer to the list of Child Care Competencies and Employability Skills, as needed.

- Complete the **Employability Skills Questionnaire: Child Care II** by rating the importance of each skill for which agreement was not reached. The average rating from round one is given in **bold** type. Your previous rating is circled in green. Compare your previous rating to the average and re-rate the item.

- If your new rating is more than one rating point from the average, please explain very briefly in the space below the item. For example:

	Human Growth	Guidance
1. Manages Time	4 3 2 1	4 3 2 1
	2.9	3.2

(Write your explanation here.)

In this example, since the average for Human Growth is 2.9, if your rating is a 2 or 3, no explanation is necessary; however, if your response is 1 or 4, please explain in the space provided. For Guidance, explain ratings of 1 or 2.

- **Please return the ivory page of the Questionnaire by** March 11, 1994.

Please accept the enclosed stickers as a token of our thanks. We appreciate your time. You are helping to shape the educational requirements of students preparing for careers in child care.

If you have questions, contact me at (806) 742-3068.

Sincerely,

Ginny Felstehausen

Ginny Felstehausen, Ph. D.

EMPLOYABILITY SKILLS QUESTIONNAIRE: CHILD CARE II

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Secondary Professionalism	Human Growth	Guidance	Curriculum
1. Manages Time.....	AGREE	4 3 2 1 2.9	4 3 2 1 3.2	AGREE
2. Manages Money.....	4 3 2 1 2.8	4 3 2 1 2.4	4 3 2 1 2.3	4 3 2 1 2.7
3. Manages Material &..... Facilities	AGREE	AGREE	AGREE	AGREE
4. Manages Human Resources	AGREE	4 3 2 1 2.9	4 3 2 1 2.9	AGREE
5. Participates as..... Member of a Team	AGREE	AGREE	AGREE	AGREE
6. Teaches Others New..... Skills	AGREE	AGREE	AGREE	AGREE
7. Serves Clients/..... Customers	AGREE	AGREE	AGREE	AGREE
8. Exercises Leadership...	AGREE	AGREE	AGREE	AGREE
9. Negotiates.....	AGREE	AGREE	AGREE	4 3 2 1 2.7
10. Works with Diversity...	AGREE	AGREE	AGREE	AGREE
11. Acquires & Evaluates... Information	AGREE	AGREE	AGREE	AGREE
12. Organizes & Maintains.. Information	AGREE	4 3 2 1 3.0	AGREE	AGREE
13. Interprets &..... Communicates Information	AGREE	AGREE	AGREE	AGREE
14. Uses Computers to..... Process Information	4 3 2 1 2.3	4 3 2 1 2.1	AGREE	4 3 2 1 1.9
15. Understands Systems....	4 3 2 1 2.9	4 3 2 1 2.8	4 3 2 1 2.7	4 3 2 1 2.7

Please continue ---

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Secondary Family/Community	Safety,Health	Program Mgt.
1. Manages Time.....	AGREE	AGREE	AGREE
2. Manages Money.....	4 3 2 1 3.0	4 3 2 1 2.3	AGREE
3. Manages Material &..... Facilities	AGREE	AGREE	AGREE
4. Manages Human Resources	4 3 2 1 2.9	4 3 2 1 2.9	AGREE
5. Participates as..... Member of a Team	AGREE	AGREE	AGREE
6. Teaches Others New..... Skills	AGREE	AGREE	AGREE
7. Serves Clients/..... Customers	AGREE	AGREE	AGREE
8. Exercises Leadership...	AGREE	4 3 2 1 3.0	AGREE
9. Negotiates.....	4 3 2 1 3.2	4 3 2 1 2.4	4 3 2 1 3.2
10. Works with Diversity...	AGREE	4 3 2 1 2.8	AGREE
11. Acquires & Evaluates... Information	AGREE	AGREE	AGREE
12. Organizes & Maintains.. Information	AGREE	AGREE	AGREE
13. Interprets &..... Communicates Information	AGREE	AGREE	AGREE
14. Uses Computers to..... Process Information	AGREE	AGREE	4 3 2 1 2.4
15. Understands Systems....	4 3 2 1 2.7	4 3 2 1 2.7	4 3 2 1 3.0
16. Monitors & Corrects.... Performance	4 3 2 1 3.2	4 3 2 1 3.4	AGREE

Please continue --->

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Secondary Professionalism	Human Growth	Guidance	Curriculum
16. Monitors & Corrects.... Performance	AGREE	AGREE	AGREE	AGREE
17. Improves or Designs.... Systems	AGREE	4 3 2 1 2.7	4 3 2 1 2.7	4 3 2 1 2.8
18. Selects Technology.....	4 3 2 1 2.6	4 3 2 1 2.2	4 3 2 1 2.3	4 3 2 1 2.6
19. Applies Technology to.. Task	4 3 2 1 2.7	4 3 2 1 2.3	4 3 2 1 2.4	4 3 2 1 2.8
20. Maintains & Trouble-... shoots Equipment	4 3 2 1 2.8	4 3 2 1 2.0	AGREE	4 3 2 1 2.6
21. Reading.....	AGREE	AGREE	AGREE	AGREE
22. Writing.....	AGREE	AGREE	AGREE	AGREE
23. Arithmetic/Mathematics.	AGREE	4 3 2 1 3.2	4 3 2 1 3.2	AGREE
24. Listening.....	AGREE	AGREE	AGREE	AGREE
25. Speaking.....	AGREE	AGREE	AGREE	AGREE
26. Creative Thinking.....	AGREE	AGREE	AGREE	AGREE
27. Decision Making.....	AGREE	AGREE	AGREE	AGREE
28. Problem Solving.....	AGREE	AGREE	AGREE	AGREE
29. Seeing Things in..... the Mind's Eye	AGREE	AGREE	AGREE	AGREE
30. Knowing How to Learn...	AGREE	AGREE	AGREE	AGREE
31. Reasoning.....	AGREE	AGREE	AGREE	AGREE
32. Responsibility.....	AGREE	AGREE	AGREE	AGREE
33. Self-Esteem.....	AGREE	AGREE	AGREE	AGREE
34. Sociability.....	AGREE	AGREE	AGREE	AGREE
35. Self-Management.....	AGREE	AGREE	AGREE	AGREE
36. Integrity/Honesty.....	AGREE	AGREE	AGREE	AGREE

Please continue---→

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Secondary Family/Community	Safety, Health	Program Mgt.
17. Improves or Designs.... Systems	4 3 2 1 2.4	4 3 2 1 2.6	4 3 2 1 2.8
18. Selects Technology.....	4 3 2 1 2.2	4 3 2 1 2.2	4 3 2 1 2.7
19. Applies Technology to.. Task	4 3 2 1 2.3	4 3 2 1 2.2	4 3 2 1 2.9
20. Maintains & Trouble-... shoots Equipment	4 3 2 1 2.3	4 3 2 1 2.5	4 3 2 1 2.9
21. Reading.....	AGREE	AGREE	AGREE
22. Writing.....	AGREE	AGREE	AGREE
23. Arithmetic/Mathematics.	4 3 2 1 3.1	4 3 2 1 2.9	AGREE
24. Listening.....	AGREE	AGREE	AGREE
25. Speaking.....	AGREE	AGREE	AGREE
26. Creative Thinking.....	AGREE	AGREE	AGREE
27. Decision Making.....	AGREE	AGREE	AGREE
28. Problem Solving.....	AGREE	AGREE	AGREE
29. Seeing Things in..... the Mind's Eye	4 3 2 1 3.2	4 3 2 1 3.1	AGREE
30. Knowing How to Learn...	AGREE	AGREE	AGREE
31. Reasoning.....	AGREE	AGREE	AGREE
32. Responsibility.....	AGREE	AGREE	AGREE
33. Self-Esteem.....	AGREE	AGREE	AGREE
34. Sociability.....	AGREE	AGREE	AGREE
35. Self-Management.....	AGREE	AGREE	AGREE
36. Integrity/Honesty.....	AGREE	AGREE	AGREE

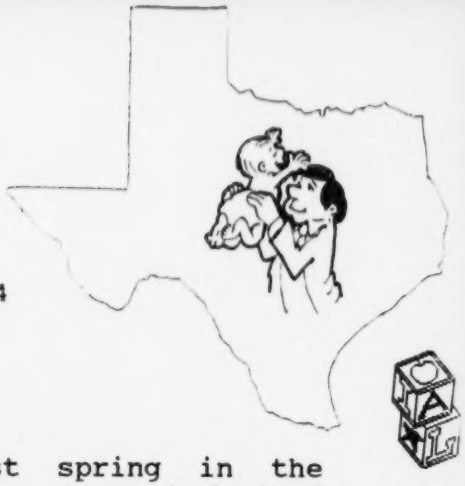
Thank you for your time and participation.

APPENDIX G.5
Employability Skills Questionnaire:
Child Care -- Secondary Round III

TEXAS TECH UNIVERSITY

Home Economics Education

Box 41162
Lubbock, TX 79409-1162



September 1, 1994

Dear Child Care Professional:

Thank you for your participation last spring in the **Employability Skills Questionnaire: Child Care.** A great deal of agreement was reached during the first and second rounds. A third round is necessary for the sixteen skills still in question for which agreement was not reached. We are asking you to rate these sixteen items again.

This packet of materials contains the **Employability Skills Questionnaire: Child Care II**, the Child Care Competencies used in Texas, and the list of Employability Skills published by the U.S. Department of Labor. The Child Care Competencies serve as a standard for students who complete secondary (high school) programs which prepare them for child care occupations. These programs prepare students for entry-level positions such as child care worker, teaching assistant, and home child care provider.

You are requested to do the following:

•Refer to the list of Child Care Competencies and Employability Skills, as needed.

•Complete the **Employability Skills Questionnaire: Child Care Round III** by rating the importance of each skill for which agreement was not reached. The average rating from round two is given in **bold** type. Your previous rating is circled in green. Compare your previous rating to the average and re-rate the item. For example:

	Human Growth
1. Manages Money	4 3 2 1
	2.4

•**Please return the ivory page of the Questionnaire by** <u>September 15, 1994</u>.

Please accept the enclosed stickers as a token of our thanks. We appreciate your time. You are helping to shape the educational requirements of students preparing for careers in child care.

If you have questions, contact me at (806) 742-3068.

Sincerely,

Ginny Feistehausen

Ginny Feistehausen, Ph. D.

Employability Skills Questionnaire:
Child Care/Secondary
Delphi Round III

Employability Skills **Competency**

	Professionalism	Human Growth	Guidance	Curriculum	Safety/ Health
Manages Money		4 3 2 1 **2.4**			
Manages Human Resources				4 3 2 1 **3.1**	
Exercises Leadership		4 3 2 1 **3.1**	4 3 2 1 **3.2**	4 3 2 1 **3.1**	
Negotiates	4 3 2 1 **3.3**	4 3 2 1 **2.9**	4 3 2 1 **3.2**		
Monitors & Corrects Performance		4 3 2 1 **3.2**	4 3 2 1 **3.1**		
Improves or Designs Systems	4 3 2 1 **3.1**			4 3 2 1 **2.8**	
Selects Technology	4 3 2 1 **2.6**	4 3 2 1 **2.2**	4 3 2 1 **2.3**		
Seeing Things in the Mind's Eye					4 3 2 1 **3.0**

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

APPENDIX H.1

Employability Skills Questionnaire: Child Care -- Postsecondary Round I

TEXAS TECH UNIVERSITY

Home Economics Education

Box 41162
Lubbock, TX 79409-1162

January 10, 1994

Dear Child Care Professional:

Because of your expertise in the area of child care, you have been selected to complete the **Employability Skills Questionnaire: Child Care.** We need your expertise to validate competencies which will be used to plan programs that prepare students for careers in child care occupations.

The packet of materials you are receiving includes the **Employability Skills Questionnaire: Child Care,** the Child Care Competencies used in Texas, and the list of Employability Skills published by the U.S. Department of Labor. The Child Care Competencies serve as a standard for students who complete advanced (postsecondary) programs which prepare them for child care occupations. These two-year programs prepare students for advanced child care occupations.

You are requested to do the following:

- Refer to the list of Child Care Competencies, as needed, to define the 7 Child Care areas (Professionalism, Human Growth, Guidance, Curriculum, etc.) Refer to the Employability Skills, as needed, for clarification of employability skills.

- Complete the **Employability Skills Questionnaire: Child Care** by rating the importance of each Employability Skill for each of the seven areas. For example: If you think "Manages Time" is very important for Professionalism and not important for Human Growth, you would respond this way for #1:

	Professionalism	Human Growth
1. Manages Time	(3) 2 1	4 3 2 (1)

- **Please return the Questionnaire by January 21, 1994.**

As part of a research project funded by the Texas Education Agency, Texas Tech University researchers are using the Delphi method to validate employability skills related to child care competencies. The enclosed questionnaire is the first step of the Delphi research process. After the results of "round one" have been tabulated, we will revise the questionnaire and return it to you. At that time you will be able to compare your ratings with the mean of all responses. Our goal is to reach consensus on the employability skill levels that professionals believe are important for child care workers completing postsecondary programs.

Your participation will help to ensure that students preparing for child care occupations develop necessary employability skills. Thank you for your time. If you have questions, please contact me at (806) 742-3068.

Sincerely,

Ginny Felstehausen

Ginny Felstehausen, Ph. D.

CHILD CARE COMPETENCIES

Directions: Please check (/) each best answer. Answer where appropriate.

1. Number of years in child care_____

2. Number of years in present position_____

3. Position title_____

4. Number of children enrolled at facility_____

5. Number of teachers/caregivers at facility_____

6. Is your facility? (Check all that apply.)
   - _____private
   - _____not-for-profit
   - _____government supported
   - _____CCMS Vendor
   - _____NAEYC Accredited
   - _____corporate-sponsored

7. Is your facility a designated training site for high school students enrolled in Child Care programs?
   - _____Yes
   - _____No

8. If so, what is the name of the high school(s)?_____

Which best describes the educational background of employees at your facility?

9. High School diploma
   - _____All
   - _____Most
   - _____Some
   - _____None

10. Employee training in child development beyond high school
    - _____All
    - _____Most
    - _____Some
    - _____None

11. Employees with Child Development Associate Credential
    - _____All
    - _____Most
    - _____Some
    - _____None

12. Which best describes the number of applicants for caregiver positions?
    - _____Many qualified applicants for each position
    - _____Position is filled without interruption at facility
    - _____Position is difficult to fill with qualified applicant
    - _____Other_____

Please Continue ---

EMPLOYABILITY SKILLS QUESTIONNAIRE: CHILD CARE

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

CHILD CARE COMPETENCIES--Postsecondary

EMPLOYABILITY SKILLS	Professionalism	Human Growth	Guidance	Curriculum
1. Manages Time.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
2. Manages Money.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
3. Manages Material & Facilities.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
4. Manages Human Resources	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
5. Participates as Member of a Team.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
6. Teaches Others New Skills.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
7. Serves Clients/ Customers.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
8. Exercises Leadership...	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
9. Negotiates.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
10. Works with Diversity...	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
11. Acquires & Evaluates Information...	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
12. Organizes & Maintains Information..	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
13. Interprets & Communicates Information.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
14. Uses Computers to Process Information.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
15. Understands Systems....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
16. Monitors & Corrects Performance....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
17. Improves or Designs Systems....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1

Please continue --->

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Circle: 4=very important:
3=important:
2=somewhat important:
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Postsecondary Family/Community	Safety, Health	Program Mgt.
1. Manages Time.....	4 3 2 1	4 3 2 1	4 3 2 1
2. Manages Money.....	4 3 2 1	4 3 2 1	4 3 2 1
3. Manages Material &..... Facilities	4 3 2 1	4 3 2 1	4 3 2 1
4. Manages Human Resources	4 3 2 1	4 3 2 1	4 3 2 1
5. Participates as..... Member of a Team	4 3 2 1	4 3 2 1	4 3 2 1
6. Teaches Others New..... Skills	4 3 2 1	4 3 2 1	4 3 2 1
7. Serves Clients/..... Customers	4 3 2 1	4 3 2 1	4 3 2 1
8. Exercises Leadership...	4 3 2 1	4 3 2 1	4 3 2 1
9. Negotiates.....	4 3 2 1	4 3 2 1	4 3 2 1
10. Works with Diversity...	4 3 2 1	4 3 2 1	4 3 2 1
11. Acquires & Evaluates... Information	4 3 2 1	4 3 2 1	4 3 2 1
12. Organizes & Maintains.. Information	4 3 2 1	4 3 2 1	4 3 2 1
13. Interprets &..... Communicates Information	4 3 2 1	4 3 2 1	4 3 2 1
14. Uses Computers to..... Process Information	4 3 2 1	4 3 2 1	4 3 2 1
15. Understands Systems....	4 3 2 1	4 3 2 1	4 3 2 1
16. Monitors & Corrects.... Performance	4 3 2 1	4 3 2 1	4 3 2 1
17. Improves or Designs.... Systems	4 3 2 1	4 3 2 1	4 3 2 1

Please continue ---

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Postsecondary Professionalism	Human Growth	Guidance	Curriculum
18. Selects Technology.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
19. Applies Technology to.. Task	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
20. Maintains & Trouble-... shoots Equipment	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
21. Reading.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
22. Writing.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
23. Arithmetic/Mathematics.	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
24. Listening.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
25. Speaking.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
26. Creative Thinking.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
27. Decision Making.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
28. Problem Solving.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
29. Seeing Things in..... the Mind's Eye	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
30. Knowing How to Learn...	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
31. Reasoning.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
32. Responsibility.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
33. Self-Esteem.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
34. Sociability.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
35. Self-Management.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1
36. Integrity/Honesty.....	4 3 2 1	4 3 2 1	4 3 2 1	4 3 2 1

Please continue--->

Circle: 4=very important:
3=important:
2=somewhat important:
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Postsecondary Family/Community	Safety, Health	Program Mgt.
18. Selects Technology.....	4 3 2 1	4 3 2 1	4 3 2 1
19. Applies Technology to.. Task	4 3 2 1	4 3 2 1	4 3 2 1
20. Maintains & Trouble-... shoots Equipment	4 3 2 1	4 3 2 1	4 3 2 1
21. Reading.....	4 3 2 1	4 3 2 1	4 3 2 1
22. Writing.....	4 3 2 1	4 3 2 1	4 3 2 1
23. Arithmetic/Mathematics.	4 3 2 1	4 3 2 1	4 3 2 1
24. Listening.....	4 3 2 1	4 3 2 1	4 3 2 1
25. Speaking.....	4 3 2 1	4 3 2 1	4 3 2 1
26. Creative Thinking.....	4 3 2 1	4 3 2 1	4 3 2 1
27. Decision Making.....	4 3 2 1	4 3 2 1	4 3 2 1
28. Problem Solving.....	4 3 2 1	4 3 2 1	4 3 2 1
29. Seeing Things in..... the Mind's Eye	4 3 2 1	4 3 2 1	4 3 2 1
30. Knowing How to Learn...	4 3 2 1	4 3 2 1	4 3 2 1
31. Reasoning.....	4 3 2 1	4 3 2 1	4 3 2 1
32. Responsibility.....	4 3 2 1	4 3 2 1	4 3 2 1
33. Self-Esteem.....	4 3 2 1	4 3 2 1	4 3 2 1
34. Sociability.....	4 3 2 1	4 3 2 1	4 3 2 1
35. Self-Management.....	4 3 2 1	4 3 2 1	4 3 2 1
36. Integrity/Honesty.....	4 3 2 1	4 3 2 1	4 3 2 1

Thank you for your time and participation.

APPENDIX H.2

Child Care Competencies -- Postsecondary

CHILD CARE COMPETENCIES--Postsecondary
(For Reference Only)

PROFESSIONALISM
Model the professional characteristics of an early childhood educator.
Demonstrate the professional skills needed for entry into the early childhood care profession as an associate teacher.
Recognize the need for participation in professional organizations for young children.
Recognize current leaders and forces shaping early childhood care and education.

HUMAN GROWTH
Analyze the major child development theories.
Demonstrate teacher behaviors that promote healthy development in children.
Implement age appropriate learning environments for children.
Utilize interventions while working with special needs children.

GUIDANCE
Demonstrate effective communication skills when working with children.
Develop and implement a guidance plan for a specified age group.
Perform skillfully appropriate guidance techniques when working with children.
Demonstrate teacher behaviors which facilitate learning activities.
Develop and implement an age-appropriate guidance plan for a child who has persistent social and/or emotional problems.

CURRICULUM
Implement a developmentally appropriate curriculum for a selected age group.
Plan and teach a developmentally appropriate curriculum for young children.
Design interest centers for a specific age group in all the major content areas.
Plan/implement an individualized program for a special needs child.

FAMILY/COMMUNITY
Plan and implement program activities which incorporate multi-cultural, non-sexist themes and materials.
Implement communication strategies which strengthen parent/child care provider relationships.
Inform parents of services available to families.
Implement advocacy activities which strengthen developmentally appropriate child care programs in the community.

SAFETY, HEALTH, AND NUTRITION
Perform by means of monitoring, teaching, supervising, and applying safety principles in a child care setting.
Perform by means of monitoring, teaching, supervising, and applying health/nutrition principles and regulations in a child care setting.

PROGRAM MANAGEMENT
Identify the administrative duties of an early childhood education director.
Apply management procedures and policies in a child care setting.
Comply with the Texas Department of Human Services Minimum Standards For Day Care Centers.

Patton, M. M., & Harriman, M. W. (1991). 2 + 2 Tech Prep Early Childhood Professions I Curriculum Guide. Austin: Texas Education Agency.

APPENDIX H.3
SCANS Supplement

EMPLOYABILITY SKILLS
(For Reference Only)

1. **Time** - Selects & ranks goal-relevant activities, allocates time, & prepares & follows schedules.

2. **Money** - Uses or prepares budgets, makes forecasts, keeps records, and make adjustments to meet objectives.

3. **Material and Facilities** - Acquires, stores, allocates, and uses materials or space efficiently.

4. **Human Resources** - Assesses skills and distributes work accordingly, evaluates performance and provides feedback.

5. **Participates as Member of a Team** - Contributes to group effort.

6. **Teaches Others New Skills**

7. **Serves Clients/Customers** - Works to satisfy customer's expectations.

8. **Exercises Leadership** - Communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.

9. **Negotiates** - Works toward agreements involving exchange .

10. **Works with Diversity** - Works well with men and women from diverse backgrounds.

11. **Acquires and Evaluates Information**

12. **Organizes and Maintains Information**

13. **Interprets and Communicates Information**

14. **Uses Computers to Process Information**

15.* **Understands Systems** - Knows how social, organizational, and technological systems work and operates effectively with them.*

16. **Monitors and Corrects Performance** - Distinguishes trends, predicts impacts on system operations, diagnoses system's performance and corrects malfunctions.

17.* **Improves or Designs Systems** - Suggests modifications to existing systems and develops new or alternative systems to improve performance.*

18.** **Selects Technology** - Chooses procedures, tools, or equipment including computers and related technologies.**

19.** **Applies Technology to Task** - Understands overall intent and proper procedures for setup and operation of equipment.**

---

*Note that **Systems** could include families; co-worker/staff; institutions such as the government, schools, and churches; and professional organizations.

Note that **Technology could include office machines, TV/VCRs, video games, record players/CDs, and overhead projectors.

20. **Maintains and Troubleshoots Equipment** - Prevents, identifies, or solves problems with equipment, including computers and other technologies.

21. **Reading** - Locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.

22. **Writing** - Communicates thoughts, ideas, information, and messages in writing; creates documents such as letters, directions, manuals, reports, graphs, and flow charts.

23. **Arithmetic/Mathematics** - Performs basic computations and approaches practical problems by choosing appropriately from a variety of mathematical techniques.

24. **Listening** - Receives, attends to, interprets, and responds to verbal messages and other cues.

25. **Speaking** - Organizes ideas and communicates orally.

26. **Creative Thinking** - Generates new ideas.

27. **Decision Making** - Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.

28. **Problem Solving** - Recognizes problems and devises and implements plan of action.

29. **Seeing Things in the Mind's Eye** - Organizes and processes symbols, pictures, graphs, objects, and other information.

30. **Knowing How to Learn** - Uses efficient learning techniques to acquire and apply new knowledge and skills.

31. **Reasoning** - Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

32. **Responsibility** - Exerts a high level of effort and perserves towards goal attainment.

33. **Self-esteem** - Believes in own self-worth and maintains a positive view of self.

34. **Sociability** - Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings.

35. **Self-Management** - Assesses self-accurately, sets personal goals, monitors progress, and exhibits self-control.

36. **Integrity/Honesty** - Chooses ethical courses of action.

The Secretary's Commission on Achieving Necessary Skills (1991). What work requires of schools: A SCANS report for America 2000. U.S. Department of Labor.

APPENDIX H.4

Employability Skills Questionnaire: Child Care – Postsecondary Round II

TEXAS TECH UNIVERSITY

Home Economics Education

Box 41162
Lubbock, TX 79409-1162

March 1, 1994

Dear Child Care Professional:

Thank you for your participation in the **Employability Skills Questionnaire: Child Care**. A great deal of agreement was reached during the first round. You will not re-rate items for which there was agreement, and "AGREE" will appear in the appropriate box. There are 76 items for which agreement was not reached. We are asking you to rate these items again.

This packet contains the **Employability Skills Questionnaire: Child Care II**, the Child Care Competencies used in Texas, and the list of Employability Skills published by the U.S. Department of Labor. Child Care Competencies serve as a standard for students who complete advanced (postsecondary) programs which prepare them for child care occupations. These two-year programs prepare students for advanced child care occupations.

You are requested to do the following:

- Refer to the list of Child Care Competencies and Employability Skills, as needed.

- Complete the **Employability Skills Questionnaire: Child Care II** by rating the importance of each skill for which agreement was not reached. The average rating from round one is given in **bold** type. Your previous rating is circled in green. Compare your previous rating to the average and re-rate the item.

- If your new rating is more than one rating point from the average, please explain very briefly in the space below the item. For example:

	Human Growth	Guidance
1. Manages time	4 3 2 1	4 3 2 1
	2.7	3.1

(Write your explanation here.)

In this example, since the average for Human Growth is 2.7, if your rating is a 2 or 3, no explanation is necessary. However, if your response is 1 or 4, please explain in the space provided. For Guidance, explain a rating of 1 or 2.

- **Please return the gray page of the Questionnaire by March 11, 1994.**

Please accept the enclosed stickers as a token of our thanks. We appreciate your time. You are helping to shape the educational requirements of students preparing for careers in child care.

If you have questions, please contact me at (806) 742-3068.

Sincerely,

Gimmy Felstehausen

Gimmy Felstehausen, Ph. D.

An Affirmative Action Institution

BEST COPY AVAILABLE

EMPLOYABILITY SKILLS QUESTIONNAIRE: CHILD CARE II

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Postsecondary Professionalism	Human Growth	Guidance	Curriculum
1. Manages Time.....	AGREE	4 3 2 1 2.7	4 3 2 1 3.1	AGREE
2. Manages Money.....	AGREE	4 3 2 1 2.6	4 3 2 1 2.1	4 3 2 1 2.4
3. Manages Material &..... Facilities	AGREE	4 3 2 1 3.0	AGREE	AGREE
4. Manages Human Resources	AGREE	AGREE	4 3 2 1 3.1	4 3 2 1 3.2
5. Participates as..... Member of a Team	AGREE	AGREE	AGREE	AGREE
6. Teaches Others New..... Skills	AGREE	AGREE	AGREE	4 3 2 1 3.3
7. Serves Clients/..... Customers	AGREE	AGREE	AGREE	AGREE
8. Exercises Leadership...	AGREE	4 3 2 1 2.7	4 3 2 1 2.9	4 3 2 1 3.1
9. Negotiates.....	AGREE	4 3 2 1 2.8	AGREE	4 3 2 1 2.9
10. Works with Diversity...	AGREE	AGREE	AGREE	AGREE
11. Acquires & Evaluates... Information	AGREE	4 3 2 1 3.1	AGREE	4 3 2 1 3.4
12. Organizes & Maintains.. Information	AGREE	AGREE	AGREE	AGREE
13. Interprets &..... Communicates Information	AGREE	AGREE	AGREE	AGREE
14. Uses Computers to..... Process Information	4 3 2 1 2.7	4 3 2 1 1.8	AGREE	4 3 2 1 2.1
15. Understands Systems....	AGREE	4 3 2 1 2.7	4 3 2 1 2.7	4 3 2 1 2.6

Please continue --->

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Postsecondary Family/Community	Safety, Health	Program Mgt.
1. Manages Time.....	AGREE	4 3 2 1 3.0	AGREE
2. Manages Money.....	4 3 2 1 2.9	4 3 2 1 2.5	4 3 2 1 3.1
3. Manages Material & Facilities.....	AGREE	4 3 2 1 3.3	AGREE
4. Manages Human Resources	AGREE	4 3 2 1 3.1	AGREE
5. Participates as Member of a Team.....	AGREE	AGREE	AGREE
6. Teaches Others New Skills.....	AGREE	AGREE	AGREE
7. Serves Clients/ Customers.....	AGREE	AGREE	AGREE
8. Exercises Leadership...	4 3 2 1 3.1	4 3 2 1 2.9	AGREE
9. Negotiates.....	AGREE	4 3 2 1 2.9	AGREE
10. Works with Diversity...	AGREE	4 3 2 1 2.9	AGREE
11. Acquires & Evaluates... Information	AGREE	4 3 2 1 3.2	AGREE
12. Organizes & Maintains.. Information	AGREE	4 3 2 1 3.2	AGREE
13. Interprets & Communicates Information.....	AGREE	AGREE	AGREE
14. Uses Computers to Process Information.....	4 3 2 1 2.0	4 3 2 1 1.9	4 3 2 1 2.8
15. Understands Systems....	4 3 2 1 2.7	4 3 2 1 2.5	4 3 2 1 3.1
16. Monitors & Corrects.... Performance	4 3 2 1 3.1	AGREE	AGREE

Please continue --->

Circle: 4=very important:
3=important:
2=somewhat important:
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Postsecondary Professionalism	Human Growth	Guidance	Curriculum
16. Monitors & Corrects.... Performance	AGREE	AGREE	AGREE	AGREE
17. Improves or Designs.... Systems	4 3 2 1 3.1	4 3 2 1 2.5	4 3 2 1 2.7	4 3 2 1 2.9
18. Selects Technology.....	4 3 2 1 2.6	4 3 2 1 2.3	4 3 2 1 2.4	4 3 2 1 2.7
19. Applies Technology to.. Task	4 3 2 1 2.7	4 3 2 1 2.2	4 3 2 1 2.3	4 3 2 1 2.9
20. Maintains & Trouble-... shoots Equipment	4 3 2 1 2.4	4 3 2 1 1.9	4 3 2 1 2.1	4 3 2 1 2.1
21. Reading.....	AGREE	AGREE	AGREE	AGREE
22. Writing.....	AGREE	AGREE	4 3 2 1 3.3	AGREE
23. Arithmetic/Mathematics.	AGREE	4 3 2 1 3.0	4 3 2 1 3.0	AGREE
24. Listening.....	AGREE	AGREE	AGREE	AGREE
25. Speaking.....	AGREE	AGREE	AGREE	AGREE
26. Creative Thinking.....	AGREE	AGREE	AGREE	AGREE
27. Decision Making.....	AGREE	AGREE	AGREE	AGREE
28. Problem Solving.....	AGREE	AGREE	AGREE	AGREE
29. Seeing Things in..... the Mind's Eye	AGREE	4 3 2 1 3.2	4 3 2 1 3.2	4 3 2 1 3.3
30. Knowing How to Learn...	AGREE	AGREE	AGREE	AGREE
31. Reasoning.....	AGREE	AGREE	AGREE	AGREE
32. Responsibility.....	AGREE	AGREE	AGREE	AGREE
33. Self-Esteem.....	AGREE	AGREE	AGREE	AGREE
34. Sociability.....	AGREE	AGREE	AGREE	AGREE
35. Self-Management.....	AGREE	AGREE	AGREE	AGREE
36. Integrity/Honesty.....	AGREE	AGREE	AGREE	AGREE

Please continue---→

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

EMPLOYABILITY SKILLS	CHILD CARE COMPETENCIES--Postsecondary Family/Community	Safety, Health	Program Mgt.
17. Improves or Designs.... Systems	4 3 2 1 2.5	4 3 2 1 3.1	AGREE
18. Selects Technology.....	4 3 2 1 2.3	4 3 2 1 2.4	AGREE
19. Applies Technology to.. Task	4 3 2 1 2.3	4 3 2 1 2.5	AGREE
20. Maintains & Trouble-... shoots Equipment	4 3 2 1 2.1	4 3 2 1 2.5	AGREE
21. Reading.....	AGREE	AGREE	AGREE
22. Writing.....	AGREE	4 3 2 1 3.3	AGREE
23. Arithmetic/Mathematics.	4 3 2 1 2.9	4 3 2 1 2.9	AGREE
24. Listening.....	AGREE	AGREE	AGREE
25. Speaking.....	AGREE	AGREE	AGREE
26. Creative Thinking.....	AGREE	AGREE	AGREE
27. Decision Making.....	AGREE	AGREE	AGREE
28. Problem Solving.....	AGREE	AGREE	AGREE
29. Seeing Things in..... the Mind's Eye	4 3 2 1 3.2	4 3 2 1 3.3	AGREE
30. Knowing How to Learn...	AGREE	AGREE	AGREE
31. Reasoning.....	AGREE	AGREE	AGREE
32. Responsibility.....	AGREE	AGREE	AGREE
33. Self-Esteem.....	AGREE	AGREE	AGREE
34. Sociability.....	AGREE	AGREE	AGREE
35. Self-Management.....	AGREE	AGREE	AGREE
36. Integrity/Honesty.....	AGREE	AGREE	AGREE

Thank you for your time and participation.

APPENDIX H.5
Employability Skills Questionnaire:
Child Care -- Postsecondary Round III

TEXAS TECH UNIVERSITY

Home Economics Education

Box 41162
Lubbock, TX 79409-1162

September 1, 1994

Dear Child Care Professional:

Thank you for your participation last spring in the **Employability Skills Questionnaire: Child Care.** A great deal of agreement was reached during the first and second rounds. A third round is necessary for the thirty-four skills still in question for which agreement was not reached. We are asking you to rate these items again.

This packet contains the **Employability Skills Questionnaire: Child Care II**, the Child Care Competencies used in Texas, and the list of Employability Skills published by the U.S. Department of Labor. Child Care Competencies serve as a standard for students who complete advanced (postsecondary) programs which prepare them for child care occupations. These two-year programs prepare students for advanced child care occupations.

You are requested to do the following:

- Refer to the list of Child Care Competencies and Employability Skills, as needed.

- Complete the **Employability Skills Questionnaire: Child Care Round III** by rating the importance of each skill for which agreement was not reached. The average rating from round two is given in **bold** type. Your previous rating is circled in green. Compare your previous rating to the average and re-rate the item. For example:

	Human Growth
1. Manages time	4 3 2 1
	2.8

- **Please return the gray page of the Questionnaire by September 15, 1994.**

Please accept the enclosed stickers as a token of our thanks. We appreciate your time. You are helping to shape the educational requirements of students preparing for careers in child care.

If you have questions, please contact me at (806) 742-3068.

Sincerely,

Ginny Feistehausen

Ginny Feistehausen, Ph. D.

Employability Skills Questionnaire:
Child Care/Post Secondary
Delphi Round III

Employability Skills **Competency**

	Profes-sionalism	Human Growth	Guidance	Curricu-lum	Family/ Commu-nity	Safety/ Health	Program Manage-ment
Manages Time		4 3 2 1 **2.8**					
Manages Money		4 3 2 1 **2.7**	4 3 2 1 **2.2**	4 3 2 1 **2.7**	4 3 2 1 **2.8**	4 3 2 1 **2.5**	
Exercises Leadership		4 3 2 1 **2.9**	4 3 2 1 **3.1**				
Negotiates				4 3 2 1 **2.9**		4 3 2 1 **2.8**	
Works with Diversity						4 3 2 1 **2.9**	
Uses Computers to Process Information	4 3 2 1 **2.8**	4 3 2 1 **1.8**		4 3 2 1 **2.4**	4 3 2 1 **2.2**	4 3 2 1 **1.9**	4 3 2 1 **3.0**
Understands Systems		4 3 2 1 **3.1**	4 3 2 1 **3.2**	4 3 2 1 **3.0**	4 3 2 1 **3.2**	4 3 2 1 **2.9**	
Improves or Designs Systems			4 3 2 1 **2.9**	4 3 2 1 **3.0**			
Selects Technology	4 3 2 1 **2.5**	4 3 2 1 **2.2**					
Applies Technology to Task		4 3 2 1 **2.2**	4 3 2 1 **2.2**	4 3 2 1 **2.9**			
Maintains & Trouble-shoots Equipment	4 3 2 1 **2.3**			4 3 2 1 **2.1**			
Arithmetic/ Mathematics		4 3 2 1 **3.1**	4 3 2 1 **3.1**		4 3 2 1 **3.0**		

Circle: 4=very important;
3=important;
2=somewhat important;
1=not important.

APPENDIX I

Competencies Telephone Interview Form

Date_____ Phone Number_____
City, State_____ Person Called_____

TELEPHONE SURVEY QUESTIONS

Introduction:
My name is _____. I am a graduate student at Texas Tech University. Recently you received a fax explaining a project funded by the Texas Education Agency. The project deals with the assessment of exit-level competencies of secondary students who have completed a sequence of courses in child care or horticulture. I am most interested in child care. If you know of any information on horticulture, please tell me. __(State)__ has been identified as having done some work in this area.

Are you familiar with the competencies that have been identified? (If yes, May I ask you a few questions?) (If no, Do you know whom I could contact to give me some information?)

**Second contact person:_____
**Phone #:_____

Do you have 15 minutes to visit with me? Or should I call you back at a more convenient time?
Reschedule time_____ Date_____

Questions:
1. Does __(state)__ have a state approved sequence of courses in child care? Yes No

2. Does your state have identified exit-level competencies in child care? Yes No_____

3. How were they identified and developed?

4. Have the competencies been validated? Yes No

5. How were these competencies validated?

6. Who was involved in the identification and/or validation process?
Business? Industry? Labor? Teachers?

7. Are the competencies published in a curriculum guide?
Yes No
Some other source?_____

8. Are the competencies being assessed? Yes No

9. What methods are being used for assessment?
Check lists?

Portfolios?
Rating Scales, etc?

10. Why were these methods chosen?

11. How could I obtain a copy of the competencies and all assessment materials?

12. Are there other agencies in your state that have materials related to child care competencies and assessment? Yes No

What is the name of the agency?
Whom do I contact?
Telephone number_____
Address

13. What other states are you aware of that have identified child care competencies and assessment?

14. Has your state done similar work in other home economics education occupations? Yes No What areas?

If so, whom should I contact?

How do I get a copy?

15. Agriculture at Texas Tech University is doing a joint project in the field of horticulture. Does your state have validated competencies in this area? Yes No

If so, whom should I contact?

How do I get a copy?

16. What about other occupational areas in your state?

Whom should I contact?

How do I get a copy?

Conclusion:
Thank you very much for you time and assistance. Your information will greatly assist us in compiling and validating an appropriate competency list. I appreciate your help. Thank you.

APPENDIX J

Authentic Assessment Telephone Interview Form

AUTHENTIC ASSESSMENT OF SELECTED TEACHERS

Teacher_____
Phone #_____
School_____
State_____

Suggested types of Authentic Assessment

1. Oral discourse
2. Exhibitions
3. Experiments
4. Portfolios
5. Score sheets
6. Observation checklists
7. Tape/video/laser recordings
8. Practical demonstrations
9. Products
10. Using a computer
11. Learning logs/journals
12. Interviews
13. Mock trials
14. Research reports

How many trials/tasks are allowed before mastery is determined?

Do you perceive the assessment as being equitable for minorities and gender?

What new assessments might you use in the future?

How useful are assessments in showing growth to students?
parents?
administrators?
employers?

Where are tasks performed?
On-the-job?
In the classroom?